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THE UNIVERSITY OF ALBERTA

A STUDY ON THE HEALTH PERCEPTIONS AND ILLNESS BEHAVIOR OF ADOLESCENT GIRLS SCREENED FOR SCOLIOSIS

Ⓒ BY

BONNIE JOHNSTON

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE
STUDIES AND RESEARCH IN PARTIAL
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DEGREE OF MASTER OF HEALTH SERVICES
ADMINISTRATION

DEPARTMENT OF HEALTH SERVICES
ADMINISTRATION AND COMMUNITY
MEDICINE

EDMONTON, ALBERTA

SPRING, 1987

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A STUDY ON THE HEALTH PERCEPTIONS AND ILLNESS BEHAVIOR OF ADOLESCENT GIRLS SCREENED FOR SCOLIOSIS submitted by BONNIE JOHNSTON in partial fulfillment of the requirements for the degree of MASTER OF HEALTH SERVICES ADMINISTRATION.

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DATE: January 29, 1987

ABSTRACT

This research was undertaken to gain some perspective on the implications associated with diagnostic labeling of adolescent girls with scoliosis. More specifically, to determine if adolescent girls who were screened and referred for x-ray and physician assessment, or re-examination in six months by a public health nurse, differed in perceptions of personal health and illness behavior from girls who had not been screened, or were screened and designated negative.

A questionnaire, developed for this study, was distributed to girls who had participated in a scoliosis screening program as well as a control group who, for the most part, had not been screened. A total of 178 useable questionnaires were returned, representing an over-all response rate of 85.8 percent. Based on survey responses: (1) respondents' personal perceptions of their general health, current health, health outlook, and health worry/concern were identified; (2) respondents' school attendance, activity limitations, recent experience with illness, and perceptions of happiness and nervousness were identified; (3) the influence of factors considered significant in providing alternative explanations for perceptions of personal health and illness behavior were examined; and (4) differences among the groups were analyzed.

The major study findings included the following:

1. Favourable health perceptions were negatively associated with increases in absenteeism from school, recent illness, bed days as a result of illness, nervousness, unhappiness, and activity limitations.
2. Significant differences in perceptions of personal health and illness behavior did not occur between the: (1) referral and recheck groups or (2) the referral-recheck groups and the negative-control groups.
3. When compared with the control group, a significantly greater degree of nervousness and worry/concern regarding personal health was demonstrated by the: (1) negative group and (2) girls who had been involved in the screening process.
4. Girls who "perceived" they had been told there was something wrong with their back demonstrated significantly less positive perceptions of their current health and health outlook than girls who indicated they had been told nothing was wrong with their back.

Recommendations focussed on: (1) additional research to substantiate and explore findings obtained in this study and (2) if similar findings are replicated, ensuring follow-up is an integral component of the scoliosis screening process.

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CHAPTER I

INTRODUCTION

1.1 Statement of the Problem

Since 1955 almost two million children have been examined for the presence of scoliosis. Yet, controversy continues to exist regarding the utility and effectiveness of school screening programs for the detection of scoliosis. Support for the program has ranged from the position that screening is an essential tool for the prevention of severe spinal deformities to the view that it is a waste of scarce and valuable resources. Torell (1981) reported that early detection and effective brace treatment have reduced the risk of progression to 40 degrees or more by at least 63 percent. In Minnesota, Lonstein (1982) found that the number of children in the state requiring surgery has diminished since 1970, in large part due to an efficient and cost effective state program. Kane (1982, p. 479) stated: "It is not, however, in the surgical or in the nonsurgical therapies that the most impressive and important advances have been made in dealing with scoliosis over the past twenty years. That distinction clearly belongs to the realization that implementation of the concept of early screening for spinal deformity is an effective and economical way to deal with scoliosis".

Dickson (1983, p. 615), on the other hand, stated: "It is clear that screening at school for scoliosis, as it is practised, does not primarily detect idiopathic scoliosis. It is an enormous waste of time, energy and money...". Leaver (1982), Mitchell (1983) and Mowat (1983), upon independently reviewing the literature, pointed out that the considerable void in knowledge regarding the natural history of idiopathic scoliosis makes it difficult to establish which children are truly "at risk", and to judge properly the effectiveness of nonsurgical treatment.

Data generated on scoliosis screening, to date, has generally failed to clarify issues central to establishing the efficacy of the program. Of particular concern in attempting to evaluate the credibility of the program is the incomplete data on the natural history of scoliosis, efficacy of brace treatment and validity of the screening procedure. While several quantitative studies are available in the literature attempting to clarify these issues, little research is available which deals specifically with the adolescents' experience during the screening process. This is an area of particular concern in view of the deficit of information which characterizes the program (British Orthopaedic Association, 1983 ; Leaver et al, 1982), high false-positive rates (Mowat, 1983; Viviani, 1984) and the particularly vulnerable developmental stage at which screening occurs (Neims, 1981).

This study will endeavor to gain some perspective on the implications associated with the diagnostic labeling of adolescent girls with scoliosis.

1.2 Objectives of the Study

The prime objective of this study is to investigate the effect of the scoliosis screening process on adolescent girls' perceptions of their own health and their illness behavior. Specifically, the study will attempt to determine if adolescent girls who are screened and designated as requiring x-ray and physician assessment (referals), or re-examination in six months by a public health nurse (rechecks), differ in perceptions of their health and illness behavior from girls who have not been screened, or were screened and designated negative.

The major research objectives are as follows:

1. To measure health perceptions and determine illness behavior of adolescent girls who have been screened for scoliosis.
2. To evaluate the relationship between perceptions of health and illness behavior.
3. To compare health perceptions and illness behavior among adolescent girls screened and referred for x-ray and physician assessment (referrals); re-examined in six months by a public health nurse (rechecks); designated negative; and not screened for scoliosis to determine if differences exist between the groups.

4. To determine if a "negative labeling effect" occurs in adolescent girls screened as "referrals" or "rechecks".
5. To gain some perspective on the effects associated with the diagnostic labeling of adolescent girls with scoliosis.
6. To explore relationships between selected variables and the health perceptions and illness behavior of adolescent girls.

1.3 Hypotheses

The major hypotheses underlying this investigation are as follows:

1. Favourable health perceptions will be negatively associated with increases in absenteeism, illness, sick days, psychological distress, and activity limitations.
2. There will be no differences in perceptions of personal health and illness behavior between the control group and the negative group.
3. Differences in perceptions of personal health and illness behavior will be demonstrated between the referral-recheck groups and the control-negative groups.
4. Differences in perceptions of personal health and illness behavior will be demonstrated between the referral group and the recheck group.

5. Differences in perceptions of personal health and illness behavior will be demonstrated between girls screened for scoliosis (referrals-rechecks-negatives) and the control group.
6. There is a relationship between being labeled with scoliosis and demonstrating less positive perceptions of personal health and illness behavior.

1.4 Significance of the Study

Scoliosis screening is presently being carried out by health agencies within Canada and in various parts of the world. Given that screening is being done and uncertainties exist regarding the efficacy of the program, it is of primary importance to be aware of possible effects generated by the screening process to ensure responsible and knowledgeable delivery of the program.

It is the intent of this study to determine if health perceptions and illness behavior are affected by the screening process. This information could potentially provide additional knowledge in the area of scoliosis screening which would be of use to health care administrators and researchers in evaluating and understanding the full impact of scoliosis screening programs.

1.5 Brief Description of the Study

This study utilized a mail survey method in order to obtain information from adolescent girls. It is a comparative study based on data collected by questionnaire measuring selected perceptions of the girls' own health and their illness behavior. Findings were compared among girls who had not been screened for scoliosis; girls who were screened and designated "negative"; and girls who were screened and designated as "referrals" or "rechecks".

For this study, the research strategy was comprised of: 1) a comprehensive review of selected literature, 2) adoption of a survey research method, target and study populations, and sampling plan, 3) development of the questionnaire, 4) distribution of the questionnaires with follow-up procedures utilized, 5) data collection, and 6) analysis and interpretation of the data.

1.6 Assumptions of the Study

The following assumptions were made regarding this study:

1. The study was carried out under the assumption that respondents would answer the questionnaire in a frank and honest manner.

2. It was assumed that the selected sample was a homogenous group representative of the study population.
3. Items on the questionnaire which measured health perceptions, activity limitations, psychological distress, and presence or absence of illness had been used in other studies. It was assumed they represented valid and reliable forms of measurement which were generalizable to the sample population in this study.
4. Since the sample population was randomly selected, it was assumed that ethnicity, occupation and educational level of parents, factors associated with health status, were evenly distributed among the groups.

1.7 Limitations of the Study

Specifically, the study has the following limitations:

1. The study sample and findings are limited to girls between the ages of 11 - 13 years.
2. Since scoliosis screening programs vary among regions in their method, expertise, population screened, and referral and follow-up protocol, generalizability outside of the study population cannot be assumed without replication.

The survey research method utilized is subject to the limitations associated with:

1. the mail questionnaire survey method;
2. uncertainty due to sampling error; and
3. measurement error.

1.8 Definitions

For the purpose of this study the following definitions shall be used.

Scoliosis: One or more lateral curves of the spine (Keim, 1979).

Labeling: Describes the psychologic impact of test results on patients (Fletcher and Fletcher, 1982).

Screening: The presumptive identification of unrecognized disease or defect by the application of tests, examination, or other procedures which can be applied rapidly to distinguish those persons who probably have a disease from those who probably do not (Commission on Chronic Illness, 1957).

Health: Refers to the equilibrium and harmony of all the possibilities of the human being: biological, psychological and social (Monnier and Deschamps, 1980).

Perceptions of Health:

Refers to the subjective assessments individuals have of their own health or well-being (Bloom and Monterossa, 1981).

Illness Behavior:

Manifestation, at a given time, of the overall impact of illness, reflecting the effects of both the clinical and subjective dimensions, as well as their interactive effects on daily life activities (Gilson, 1975).

Activity Limitations:

Refers to the reduction or restriction of an individual's activities because of a health problem or physical condition.

False-Positive:

A positive screening test result when the disease is actually absent (Fletcher and Fletcher, 1982).

Negative: Screening category designated by a Public Health Agency for girls with no observable form of scoliosis.

Recheck: Screening category designated by a Public Health Agency for girls with a questionable or small deviation who are re-examined at six month intervals by public health nurses until they are taken off the recheck list.

Referrals: Screening category designated by a Public Health Agency for girls with an obvious deviation who are referred for x-ray and physician assessment.

1.9 Organization of the Thesis

This report is comprised of five main sections. The preceeding chapter provided the introductory material. Chapter II presents a review of selected, pertinent literature. In Chapter III the research design and methodology used in the study are described. Data analysis and results of the study are discussed in Chapter IV and the final chapter contains a summary of the study, conclusions and recommedations. The Appendices include pertinent correspondence and a sample of the research instrument used in this study.

CHAPTER II

A SELECTIVE REVIEW OF THE LITERATURE

The purpose of this chapter is to provide an over-view of pertinent literature on scoliosis screening and the concept of labeling. On the basis of this information the need and rationale underlying this research project will be demonstrated. The literature review includes four components: 1) an over-view and evaluation of scoliosis screening, 2) a discussion on the acceptability of scoliosis screening for the early adolescent population, 3) an over-view of the labeling effect, and 4) a summary.

2.1 An Over-View and Evaluation of Scoliosis Screening

Screening has been defined as the "presumptive identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly". Furthermore, "screening tests sort out apparently well persons who have a disease from those who probably do not. A screening test is not intended to be diagnostic. Persons with positive or suspicious findings must be referred to their physicians for diagnosis and treatment" (Fletcher and Fletcher, 1982, p. 67; Whitby, 1974, p. 819).

Certain criteria or principles which act as guides in evaluating screening programs have been developed by a number of experts. An evaluation of the scoliosis screening program which incorporates screening criteria developed by Wilson (1965) and Whitby (1974) is provided in Table I. Table II, formulated by the British Orthopaedic Association (1983), provides an additional summary of concerns associated with scoliosis screening programs.

In reviewing the available information on scoliosis and scoliosis screening, it is apparent that a deficit of information exists in practically every area. Of particular concern in attempting to evaluate the credibility of the program is the incomplete data on the natural history of scoliosis; the acceptability and effectiveness of different forms of treatment; and the validity of the screening procedure.

TABLE 1

Evaluation of Scoliosis Screening as a Valid Screening Program

Screening Criteria	Scoliosis Screening
1. Abnormality being sought should be adequately defined.	1. Clarification of the type of scoliosis surveyed and standardized criteria for establishing what constitutes a "case" are required (Leaver et al, 1982: Kane, 1977, Mowat, 1983; Lonstein, 1976; Nachemson et al, 1982; Dickson, 1983; Keim, 1979).
2. Condition being sought should be an important health problem for the individual and the community.	2. Scoliosis appears to be an important problem for the individual and has the potential of drawing substantially from community resources (Nachemson, 1965; Neisonne, 1968; Leaver et al, 1982; Drummond, 1976).
3. Population being screened for the abnormality should be defined in operational terms.	3. Although discrepancies exist as to which age group and sex to screen, it would appear that progress is being made in identifying and targeting the most susceptible segment of the population (Mowat, 1983; Golomb, 1975; Liston, 1981; Tanner, 1962; Verrier et al, 1979; Leaver et al, 1982; Golomb, 1975).
4. Natural history should be adequately understood.	4. To date, central issues clarifying the length of the latent or asymptomatic phase of the condition; the proportions of the population which progress, undergo remission, or arrest; and when these events occur remain unclear and incomplete in explaining the natural history of scoliosis (Mowat,

TABLE 1 (cont'd)

	1983; Dickson, 1983; Drummond, 1976; Lonstein, 1984; Warren, 1986; Armstrong, 1982; Schultz, 1979; Redford, 1969; Ponte, 1982; Verrier et al, 1979; Robin, 1977; Weinstein & Ponseti, 1978).
5. There should be an acceptable form of treatment.	5. There are significant areas of doubt about the indications for and benefits of various forms of treatment available (Piggott, 1977; Torell, 1981; Rogala, 1978; Blount and Moe, 1980; Bobechko, 1975; Mellencamp, 1976; Carr et al, 1980; Dickson, 1984; Warren et al, 1981; Leaver et al, 1982; Verrier et al, 1979; Edmonson & Morris, 1977; Blout, 1958; Moe & Kettleson, 1970; Edgar, 1970; Siegler, 1979; Allard, 1984; MacEwen, 1975; Halliday, 1984; Brooks, 1979; Hungerford, 1975; Herbert; 1980).
6. Agreed policy on treatment.	6. Criteria standardizing acceptable "endpoints" for treatment of scoliosis have not been established (Moe and Winter, 1978; Torell, 1981; Mellencamp, 1977).
7. Suitable test of examination.	7. More work is required to develop a suitable screening procedure to ensure that all significant cases are found and to reduce the large number of unnecessary referrals (false-positives) (Viviani, 1984; Howell et al, 1978; Williams et al, 1980; Mowat, 1983; Cassels, 1977; Howell, 1983; Fletcher and Fletcher, 1982; Viviani, 1982; Willner, 1982; Adair et al, 1977).

TABLE 1 (cont'd)

8. Test acceptable to population.	8. More information is required on the adolescent's understanding, perceptions and concerns in relation to the screening process (Howell, 1983; Viviani, 1982; Kane, 1977; Quick and Highriter, 1981; Lonstein et al, 1982; Wynne, 1984).
9. Facilities for diagnosis and treatment.	9. More facts are required to accurately assess the implications of mass screening on diagnostic and treatment facilities (Leaver et al, 1982; Torell, 1981; Kane, 1977).
10. Cost related to other medical care expenditures.	10. Estimation of costs vary between regions, are dependent on screening criteria, follow-up and treatment protocol; frequently do not reflect total cost; and fail to recognize side effects associated with the screening (Gurr, 1976; Lonstein et al, 1982; Howell, 1984; Mowat, 1983).
11. Screening must be a continuous process and not a "once and for all" programme.	11. Data required to determine the periodicity of rescreening normal children has not been published (Leaver et al, 1982).

TABLE II

Current Concerns About Scoliosis Screening

1. The forward bend test is too sensitive and not sufficiently specific.
2. The best ages at which to screen are undetermined.
3. It is not known how worthwhile it would be to screen boys as compared to girls.
4. Too many children are referred to hospitals from present screening programs.
5. The criteria for referral are not clear.
6. The best methods of radiography have not been established.
7. Most small curves need no treatment.
8. Unnecessary treatment may often result from screening programs.
9. Regional variations in prevalence need to be identified and explained.
10. The natural history of scoliosis is unknown.
11. Criteria to predict outcome are not available.
12. Further study of morbidity arising from scoliosis is necessary.
13. There is not complete agreement on the definition of scoliosis.
14. The dividing line from normality is blurred.
15. No single clinic could adequately seek answers to all these questions.
16. The cost of screening is not yet quantified.
17. There are lost "opportunity" costs.

British Orthopaedic Association Br. Med. J., 1983 287 963-4.

Natural History:

The natural history of idiopathic scoliosis is not currently understood. As illustrated in Table III, the incidence of curve progression varies considerably in reported studies. In Mowat's survey of the literature (1983), five percent to 33 percent of the curves had increased significantly, and from three percent to 40 percent had decreased. He surmised that with a typical curve of about ten degrees, there are approximately equal chances of it getting worse, getting better, or staying the same over the ensuing few years. Dickson (1983) reported that 90 percent of spinal scoliosis either remain static or regress. The ten percent that progress resemble true idiopathic scoliosis, with right thoracic curves in girls showing a real potential for progression. A report produced by the Prevalence and Natural History Committee (1982) indicated that no progression occurs in the vast majority of patients seen with curves of 19 degrees or less, and overall still less than 50 percent of patients with curves 20-29 degrees do not progress.

Factors which have been investigated to determine a relation with curve progression in idiopathic scoliosis are provided in Table IV. Clearly, better and longer term studies of the natural history of the condition are required to provide more information concerning the influence of these variables.

TABLE III

Incidence of Curve Progression

Study	No. of Patients	Range of Magnitude of Curves	Percentage of Curves that Progressed
1. Brooks et al (1975)	134	--	5.2% progressed by 5° 22.4% decreased by 5°
2. Clarisse (1974)	110	10-29°	Untreated, 35% progressed
3. Rogala et al (1978)	603	--	6.8% progressed 2.1% progressed in curves 10° 10.3% progressed in curves 10°
4. Fustler (1980)	100	45°	56% progressive
	70	30°	82% progressive
5. Bunnell (1983)	326	20-30°	20% progressive
6. Dickson et al (1980)	42	10°	14.2% progressive

TABLE IV

Factors Investigated Relating to Curve Progression
In Idiopathic Scoliosis

Agreed	Controversial	Not Proven
Pattern of the Curve	Sex	Flexibility of the Curve
Age	Family History	Sagittal Deformities
Menses	Magnitude of the Curve	Lumbosacral Abnormalities
Risser Sign		Alignment of the Trunk

Treatment:

Significant areas of doubt exist concerning the indications for and benefits of various forms of treatment for scoliosis. Piggott (1977, p. 34) in reviewing the choices of management and treatment available for the care of patients with scoliosis wrote: "Treatment is arduous for both child and parents, and though much improvement may result, the spine will not become normal".

To better understand the net effect of treatment, it would be necessary to deny some children the recommended treatment to be able to observe what happens when curves are not treated in the standard manner. Given the possible end results, most orthopaedic surgeons have considered withholding treatment ethically unacceptable. In view of the lack of information on the natural progression of scoliosis; doubt concerning the efficacy of brace treatment (Carr et al, 1980; Mellencamp et al, 1976); and no available investigations involving control patients; it is difficult to determine the net effect of treatment and its influence on the course of scoliosis.

Screening Procedure:

The test usually used in scoliosis screening is the forward bend test which involves clinical inspection of the back when standing upright and on bending forward. The reliability and validity of this test appears suspect. Of the 20 papers reviewed (available in Table V), only three reported on inter- or intra-observer reliability. In Viviani's study (1984) the accuracy of individual nurses, who attended special training workshops, ranged from 53 to 88 percent with overall accuracy assessed to be high. On the basis of these results, Viviani stressed that only public health nurses whose examination skills have been adequately tested should be allowed to participate in school scoliosis screening programs. Howell et al (1978) developed videotaped educational packages to train nurses and then proceeded to evaluate the nurse's skills. They found the nurse-screeners failed to detect 26 percent (and a physiotherapist 13 percent) of the asymmetries present in children with curves of at least 10 degrees. Williams et al (1980) considered their findings of 60 percent agreement among screeners to constitute an unacceptably low level of reliability. Consistent with Howell's (1983) view, it would appear that much of the difficulty with this procedure is related to its "observation and judgement" approach.

TABLE V

Reported Reliability and Validity of the Forward Bend Test

	Study	Reliability	Validity
1.	Lonstein et al (1976)	Not Stated	Not Stated
2.	Drennan et al (1977)	Not Stated	Not Stated
3.	Dickson et al (1980)	Not Stated	18% false positives reported
4.	Lezberg (1974)	Not Stated	Not Stated
5.	Dickson (1983)	Not Stated	Not Stated
6.	Seels and May (1974)	Not Stated	9% false positives reported
7.	Wallace (1977)	Not Stated	Not Stated
8.	Benson (1977)	Not Stated	Not Stated
9.	Newman et al (1977)	Not Stated	Not Stated
10.	O'Brien et al (1977)	Not Stated	Not Stated
11.	Goldberg et al (1980)	Not Stated	Not Stated
12.	Smyrnes et al (1979)	Not Stated	Not Stated
13.	Willner (1982)	Not Stated	Not Stated
14.	Miller et al (1982)	Not Stated	Not Stated
15.	Viviani et al (1984)	Accuracy of individual nurses was reported to range from 53% to 88%	73.9% Sensitivity 77.8% Specificity 75.3% Accuracy
16.	Gore et al (1981)	Not Stated	Not Stated
17.	Howell (1978)	Reported that nurse-screeners failed to detect 26% and a physiotherapist 13% of asymmetrics present in children with curves of at least 10°	Calculated against the findings on re-screening and against x-ray measurement

TABLE V (cont'd)

Study	Reliability	Validity
18. Williams et al (1980)	18. Reported 60% agreement among screeners - considered unacceptable	18. 23% false negatives 60% false positives 77% sensitivity 40% specificity
19. Cassels (1977)	19. Not Stated	19. 29% false positives 72% reported false negatives 46% accuracy
20. Adair et al (1977)	20. Results incorrectly calculated	20. -
21. Black (1984)	21. Not Stated	21. 64% accuracy

Criteria for evaluating validity of screening tests require that the rates of sensitivity and specificity should be at least 90 percent and preferably 95 percent (Fletcher and Fletcher, 1982). Only six of the 20 papers reviewed provided information on some aspect of validity. Results ranged from nine to 60 percent for false positives; 40 to 78 percent for specificity; and 46 to 75 percent for accuracy. Sensitivity was relatively consistent at a reported 74 and 77 percent. Howell (1983) reports sensitivity of nurse-screeners which varied from 25 to 73 percent and Mowat (1983) calculated that of those referred for definite evaluation, three out of four, or four out of five will be found not to have scoliosis of any significant degree. Viviani's study (1982) found that 88 percent of the children referred by the nurses for x-ray do not have scoliosis while they miss 25 percent of the children with curves of 10 to 20 degrees. Clearly, the significant variability in results for the forward bend test with sensitivity and specificity rates far removed from the 95 percent screening criteria question the efficiency of this procedure. It would appear that more work is required to develop a suitable screening procedure to ensure that all significant cases are found and to reduce the large number of unnecessary referrals (false positives).

The conclusion drawn from examining this evidence is that more research and developmental work is required to establish the value of scoliosis screening, and in particular, the possibility of adverse effects generated by the screening process.

2.2 Test Acceptable to the Population Being Screened

A review of selected literature indicated that studies on scoliosis have focused primarily on attempting to provide more information and clarification on the clinical aspects of the condition and validity of the screening procedure. Little research is available which deals specifically with the acceptability and effects of the screening procedure for the population being screened. Howell (1984) refers to the amount of worry engendered in children undergoing screening, especially for those who are first picked out as needing further testing. Viviani (1982) and Kane (1977) express concern about the subsequent effects for a large number of the population with insignificant curves labeled as having scoliosis. Berwick (1985) recently commented on the vast majority of children with insignificant curves who, with their parents, must adapt to a new label with the potential for insult to self-image and peace of mind. The amount of quantitative and qualitative analysis investigating and substantiating these concerns however, is minimal with research in the area focusing primarily on psychological responses to treatment (Wickers and Bunch, 1977; Naikan, 1977). Quick and Highriter's study (1981) was one of the few studies available for review that dealt specifically with screening. The study investigated the importance of privacy in scoliosis screening and found that provision of individual privacy during screening contributed to a more positive experience for students. In one other study, Wynne (1984) noted that the absentee rate during scoliosis screening was normal and considered this an obtrusive measure of acceptability.

Preliminary Study:

The lack of literature available dealing with the psychological effects of the screening process on the adolescent girl initiated the need for preliminary investigation in the area (Johnston, 1985). A questionnaire was distributed to a sample of girls screened by a Public Health Agency that had expressed specific concern and interest in this area. The intent of the study was to identify: (1) adolescent girls' knowledge of scoliosis and the screening process and (2) adolescent girls' feelings and perceptions of scoliosis in relation to body image and the screening procedure. The sample included girls screened by public health nurses who had been screened negative; girls with a questionable or small deviation requiring monitoring by public health nurses (rechecks); and girls with an obvious deviation who were referred for x-ray and examination by a physician (referrals).

Relevant findings indicated that: (1) following screening a high proportion of girls, approximately seven in ten of those screened negative, one in two of the rechecks, and two in five of the referrals demonstrated some misconceptions regarding how an individual with scoliosis would appear physicially and be perceived by others; (2) approximately one in three girls in the referral group indicated the need for more information and clarification on the progression, treatment and outcome of scoliosis and; (3) approximately two in three girls indicated they had experienced some stress associated with the screening process which was generally related to the possibility of being found to have scoliosis.

The stress, high proportion of girls who demonstrated misconceptions regarding scoliosis following screening and the need for information expressed by girls in the referral group indicated that the scoliosis screening process may generate adverse effects. The implications associated with designating or labeling individuals with scoliosis, particularly the vast majority who have insignificant curves, clearly required further investigation.

2.3 "Labeling Effect"

It has been speculated in the literature that in screening for disease or risk factors of disease (for the prevention of disability and premature death) "labeling" individuals "sick" or "at risk" may have deleterious effects on the individual screened (Benfari, 1981; Hayes et al, 1981; Fletcher et al, 1982). This may have particular significance in the screening of adolescents for scoliosis. The program is characterized by a deficit of information in most areas (British Orthopaedic Association, 1983;Leaver et al, 1982), high false-positive rates (Mowat, 1983; Viviani, 1984), has been shown to generate stress among adolescent girls (Johnston, 1985), and is carried out at a developmental stage when adolescents are particularly insecure (Nelms, 1981) and preoccupied with appearance (Dwyer, 1968).

Relevant Studies:

The effects of labeling people with insignificant conditions has been documented for heart murmurs and hypertension. Haynes, Sackett and Taylor (1978) found that among individuals previously unaware of their hypertensive status, the label of "hypertensive" was associated with a significant increase of absenteeism from work which could not be explained by the medical condition itself. Alternately, Alderman and Davis (1976) have demonstrated that being identified and treated as hypertensive may actually cut down on absenteeism from work. This finding does not necessarily refute the findings of Haynes et al (1978) as illness episodes in the Alderman study includes only episodes in excess of four days.

Bergman and Stamm (1967) investigated the implications of a diagnosis of cardiovascular disease in children and found that although 18 percent were found to have organic heart disease, 40 percent of the group had experienced either psychological or physical restrictions. The falsely diagnosed group were perceived as unhealthy by themselves and their parents. Caylor, Lynn and Stein (1973) evaluated a group of thirty-four children whose physical activities had been limited because of a suspected cardiovascular condition that later was found not to exist. They concluded that the accumulative emotional factors of the diagnosis of heart disease, especially if accompanied by physical restrictions, are detrimental to intellectual development.

Labeling The Early Adolescent:

Screening for scoliosis generally occurs during a particularly vulnerable developmental stage designated as early adolescence. This period begins with the first physical changes of puberty.

in girls, this may be anywhere between the ages of 11 and 13, while in boys it comes slightly later, somewhere between 12 and 14 (Westwood, 1986; Mercer, 1979; Simmons, 1973; Elkind, 1984).

It is a stage during which young people have great difficulty in communicating their feelings and their needs to older adults, including their parents, doctor or other "significant" adults in their lives (Westwood, 1986). A study done by Simmons (1973) found that early adolescents from 12 to 13 years of age had heightened self-consciousness, less stability of the self-image, lower self-esteem, and perceived that others held less favourable views of them to a greater degree than any other age group from the third through the twelfth grade. The self-image disturbance is considered to appear suddenly between the 11th and 12th years when the physical growth spurt usually begins. Adams (1973) found that with the significant growth spurt which occurs during this period, teenagers focus on the task of becoming comfortable with their own bodies. They become preoccupied with the changes in terms of attractiveness, cultural and social norms, and study their bodies comparing various aspects of them with those of their peers (Norris, 1978). The early adolescent is concerned with anything that affects the appearance of his body or its function (Mercer, 1979). Being different in appearance from one's peers often seems tantamount to being inferior (Dwyer, 1968). Teen-aged girls are even more interested in and concerned about their physical development than are boys. The reason, speculated by Dwyer (1968), is that outward appearance and the inward self are more closely bound in females than in males.

This state of flux experienced by young girls in the early phase of adolescence makes them particularly vulnerable to variations in appearance which are perceived to deviate from the norm. Consistent with concerns expressed by Viviani (1982), Kane (1977) and Berwick (1985), labeling young adolescents with scoliosis, at this particular stage of development , carries with it the potential for insult to self-image, peace of mind and successful progression to later phases of adolescence.

Labeling And Perceptions Of Health:

Labeling's specific effect on perceptions of personal health and behavior, investigated in previous studies, is of particular interest in view of psychosocial changes which are reported to occur when health is perceived to deviate from the norm. Wright (1960) identified the tendency for a person to see himself limited in areas unrelated to his illness or condition resulting in a generalized devaluation of body function and perhaps even a devaluation of the "self" as a person. Bergman and Stamm (1967) refer to the need of "delabeling" children thought to have heart disease whose lives can be needlessly and adversely affected.

Haynes (1978) suggested that newly labeled patients "adopt the sick role" treating themselves as more "fragile". Bloom and Monterossa (1981) proposed that the decrease in perception of personal well-being observed in their study was not due to participants being sicker or having more frequent contact with the medical care system, but rather to the existence of a "non-disease state" possibly caused by being labeled as hypertensive. They concluded that judgements made by the health care provider and client evoke changes in perceptions and state of personal health regardless of the validity of the judgments.

The implications of these effects are especially worrisome and harmful if they occur among individuals with false-positive tests (Fletcher and Fletcher, 1982). This has particular significance in scoliosis screening where Mowat (1983) estimates that three out of four, or four out of five, referred for definite evaluation will be found not to have scoliosis of significant degree. Viviani's (1982) findings similarly indicate that 88 percent of the children referred by nurses for x-ray, do not have scoliosis of any significant degree.

Conclusion:

Literature available on the "labeling effect" generally indicates that labeling individuals "sick" or "at risk" has the potential to adversely affect changes in an individual's perceptions and state of health. Since adolescents are: (1) screened for scoliosis at a particularly vulnerable stage and (2) the majority are found to have insignificant curves, it is of utmost importance to determine if the scoliosis screening process adversely affects perceptions of personal health and illness behavior.

2.4 Summary Of Literature Review

At the present time there is a great deal of interest and controversy concerning school screening programmes for the detection of scoliosis. Support for this program has ranged from full endorsement by the American Academy of Orthopedic Surgeons in 1974 (Newman, 1977) to the position taken by the Canadian Task Force in 1980 stating: "There is no scientific justification for the view that screening and/or casefinding for scoliosis is distinctly beneficial".

It is apparent, from a review of the literature, that data generated on scoliosis screening, to date, has failed to clarify issues central to establishing the efficacy of the program. While the literature contains several quantitative and descriptive studies attempting to provide more information on the clinical aspects of scoliosis and validity of the screening procedure, little research is available which deals specifically with the adolescent's experience during the screening process.

The apparent lack of information dealing with the effects of the scoliosis screening process on the adolescent girl initiated the need for preliminary investigation, by the author, in this area. Findings obtained on a survey distributed to girls who had been screened for scoliosis by a Public Health Agency indicated that the screening process may generate adverse affects and identified the need for further investigation to understand more fully the implications associated with labeling young girls with scoliosis, particularly the vast majority who have insignificant curves.

In reviewing the literature further, a paucity of information was found to exist regarding the effects of labeling, and specifically, regarding the psychological effects of the scoliosis screening process on the adolescent girl. Literature which is available suggests that labeling individuals "sick" or "at risk" has the potential to adversely affect changes in an individual's perceptions and state of health.

To this author's knowledge, there are no studies which have examined the concept of labeling in relation to its effects on young adolescents screened for scoliosis. The deficit of information characterizing the scoliosis screening program, high false-positve rates, stress generated by the screening, the high proportion of adolescents screened who demonstrate misconceptions regarding scoliosis, the particularly vulnerable age at which screening occurs, and limited research available on the implications associated with labeling support the need to assess the effects of the scoliosis screening process on the early adolescent girl.

This study was designed to obtain information which would assist in assessing specific effects that the scoliosis screening process may have on adolescent girls' perceptions of personal health and illness behavior. The methodology employed is discussed in the following chapter.

CHAPTER III

METHODOLOGY

The purpose of this chapter is to describe the study methodology that was used by discussion of: 1) the research strategy, 2) questionnaire development, 3) questionnaire distribution and data collection, and 4) the data analysis strategies.

3.1 Research Strategy

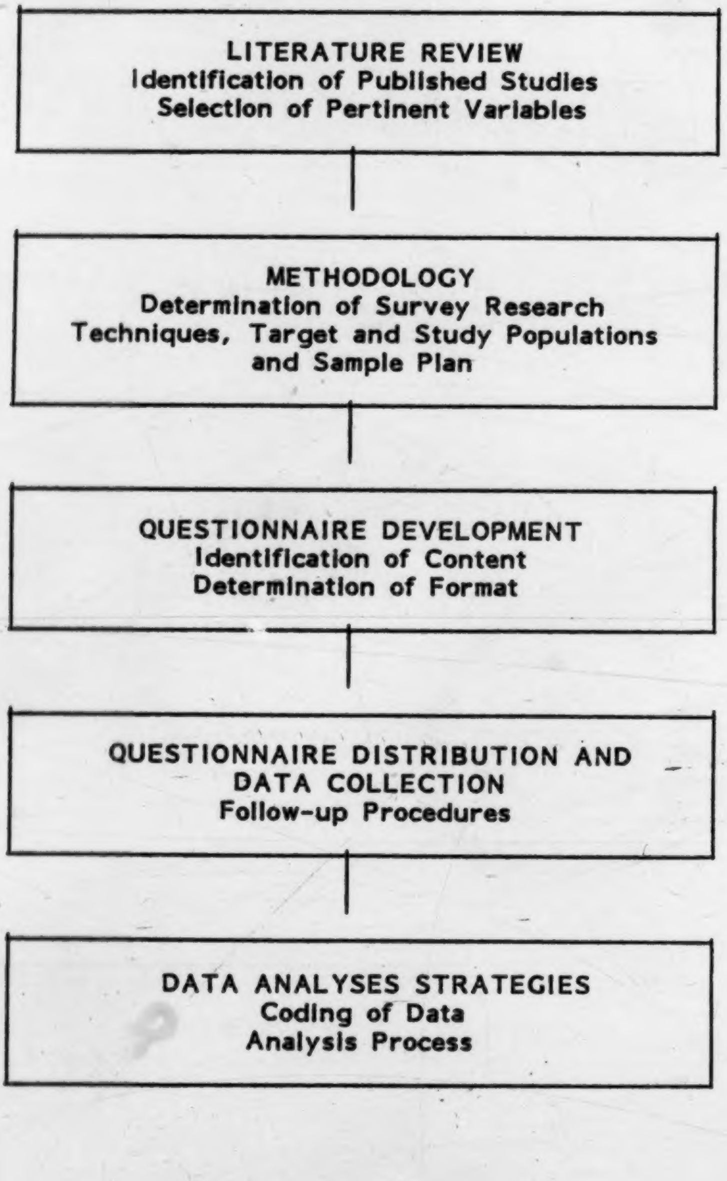
A review of selected literature indicated that studies on scoliosis focused primarily on clinical aspects of the condition and validity of the screening procedure with minimal research available on how the screening process affected the adolescent girl. Studies related to this area tended to focus primarily on psychological responses to treatment (Wickers and Bunch, 1977; Naikan, 1977). A study by Quick and Highriter (1981) was one of the few studies available for review that dealt with the emotional aspects of screening and identified the importance of providing privacy during screening for adolescents. In reviewing studies related to the concept of labeling, it was noted that research in this area has been primarily restricted to the conditions of hypertension in adults and heart murmurs in children.

These identified research limitations prompted the need for investigation in this area to gain some perspective on psychological effects associated with the diagnostic labeling of adolescent girls with scoliosis. Specifically, to determine if adolescent girls who were screened and designated as requiring x-ray and physician assessment (referrals), or re-examination in six months by a public health nurse (rechecks), differed in perceptions of their health and illness behavior from girls who had not been screened, or were screened and designated negative. To meet this objective several steps were taken to develop an appropriate research strategy (Fiqure 1).

The initial step of the research strategy was to carry out a review of selected literature to establish the theoretical underpinnings of this research project. The studies that were examined: 1) provided an over-view of the present state of knowledge on scoliosis and scoliosis screening, 2) identified research limitations, 3) aided in the development of the research methodology, and 4) identified salient aspects of health status that should be examined when assessing perceptions of personal health and illness behavior.

FIGURE 1

Research Strategy


LITERATURE REVIEW
Identification of Published Studies
Selection of Pertinent Variables
METHODOLOGY
Determination of Survey Research Techniques, Target and Study Populations and Sample Plan
QUESTIONNAIRE DEVELOPMENT
Identification of Content
Determination of Format
QUESTIONNAIRE DISTRIBUTION AND DATA COLLECTION
Follow-up Procedures
DATA ANALYSES STRATEGIES
Coding of Data
Analysis Process

Survey Research Approach:

The data collection method selected to obtain information from the study population was the mail questionnaire survey. The mail survey had the advantages of being economical, less time consuming for both investigator and respondent, and allowed information to be collected across a wide geographical area in less time than would be required by a data collection technique such as the personal interview. Other advantages of the mail survey are the absence of interviewer bias, a possibility of frank and honest responses as anonymity of respondents is ensured, and the fact that respondents are allowed more response time (Rachwalski, 1985; p. 68-70).

Disadvantages of this method include a low response rate, potential bias due to systematic non-response, inability to control the sequence of questions and answers, misinterpretation of questions, inability to clarify ambiguous answers, and the questionnaire may be completed by someone other than the individual for whom it was intended (Rachwalski, 1985; p. 70). Recognizing the disadvantages and limitations associated with this particular method, strategies were employed to increase the response rate and measures were taken to ensure that the format and items contained in the questionnaire would provide clarity and ease of interpretation (to be discussed in subsequent sections). A letter of explanation was also provided for parents to stress the importance of having their daughter complete the questions without parental assistance (Appendix A and B).

Study Population

For the purposes of this study the target population was defined as all girls who had been screened for scoliosis by the Edmonton Board of Health. The Edmonton Board of Health, who have screened for scoliosis since 1979, differentiate among three categories in their screening process: girls with no observable form of scoliosis (normal or negative); girls with a questionable or small deviation who are re-examined at six month intervals by public health nurses (rechecks); and girls with an obvious deviation who are referred by public health nurses for x-ray and examination by a physician (referrals).

To maintain consistency and ensure reasonable ease of access to respondents, the study population was comprised of girls screened in the sixth grade for scoliosis by the Edmonton Board of Health in the spring of 1985. Girls who resided outside of Edmonton and within the boundaries of a health unit that did not provide scoliosis screening were selected as a control group. This group was considered representative of the stage of early adolescence (Nelms, 1981) and , with the exception of those who may have moved from other areas or been checked for scoliosis by physicians, projected the early adolescents' perspective on personal health and illness behavior without the influence of having participated in a scoliosis screening program. An over-view of the study population is provided in Figure 2.

Sampling Plan

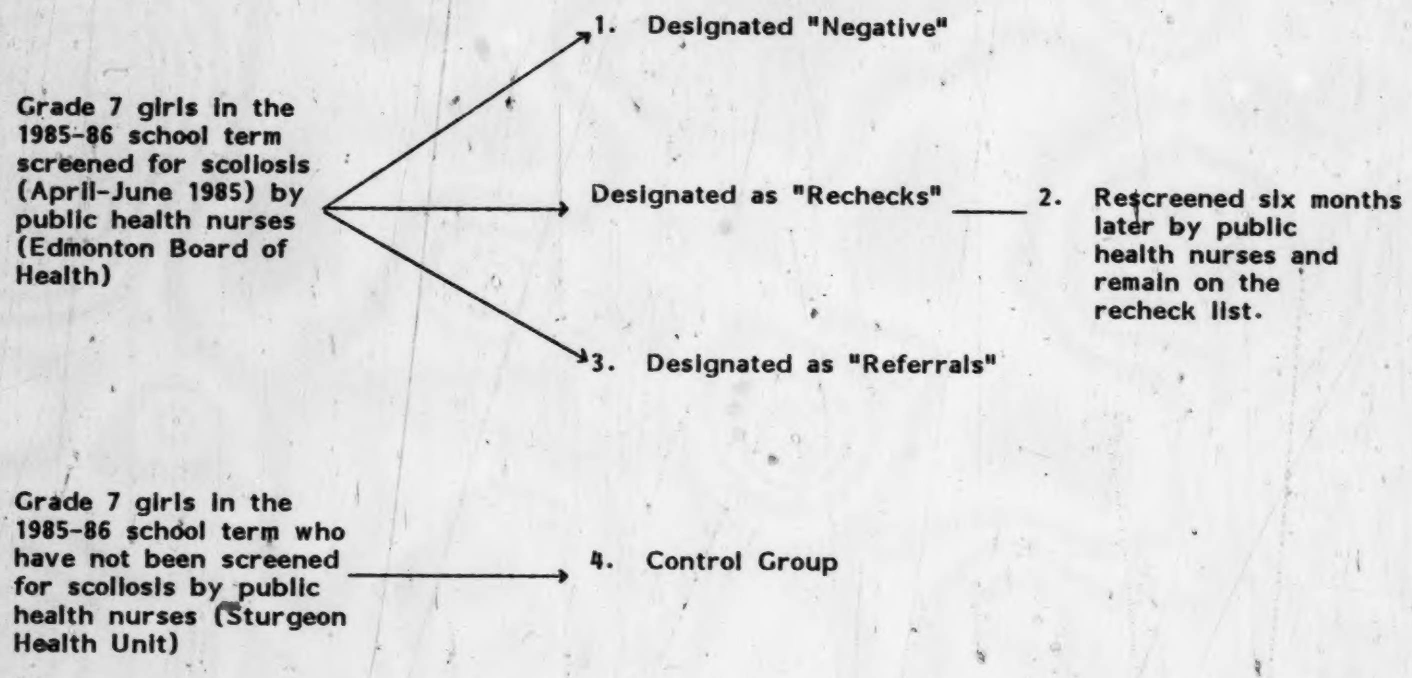
The categories obtained from the screening of grade six girls by public health nurses during April, 1985 to June, 1985 totalled 2799 negatives (90 percent), 283 rechecks (9.1 percent) and 29 referrals (.9 percent). In order to obtain a 95 percent chance of picking up a difference of one standard deviation, it was estimated that 26 girls were required in each group (Colton, 1974; p. 142).

To compensate for questionnaires that may not be returned, approximately double the estimated calculation or 60 negatives and 60 rechecks were randomly selected from among categories designated on school screening lists. Girls in the recheck category had been rechecked once since the initial screen by public health nurses and continued to remain in the recheck category following the second screen.

Since the referral group represented such a limited number, all 29 referrals were included in the sample. The degree of

FIGURE 2

Study Population


Grade 7 girls in the 1985-86 school term screened for scoliosis (April-June 1985) by public health nurses (Edmonton Board of Health)
1. Designated "Negative"
Designated as "Rechecks"
2. Rescreened six months later by public health nurses and remain on the recheck list.
3. Designated as "Referrals"
Grade 7 girls in the 1985-86 school term who have not been screened for scoliosis by public health nurses (Sturgeon Health Unit)
4. Control Group

curvature, obtained from x-ray and physician assessments, ranged from 0-31 degrees. Twenty-one percent of the girls had curves greater than or equal to 15 degrees and were considered "at risk" according to agency screening protocol, with 79 percent of curves less than 15 degrees. Approximately seven in ten of the girls were being monitored for scoliosis by physicians. (Refer to Table VI).

Sixty girls, comprising the control group, were randomly selected from among school class lists which contained the names of 240 grade seven girls who resided within the boundaries of the Sturgeon Health Unit. These girls, with the exception of those who may have come from other areas or been checked by physicians, had not been screened for scoliosis by this health unit.

Table VII indicates the number of girls in each category, sample size selected, sampling fractions, estimated response rates, and estimated usable returns for each sub-population. Estimated response rates were based on the return of questionnaires by this age group from the preliminary survey conducted in March 1984, which investigated adolescent girls' knowledge and perceptions of scoliosis and scoliosis screening (Johnston, 1985). Questionnaires returned from this particular survey totalled 67 percent for the referral category, 58 percent for the recheck category, and 71 percent for the normal category. The response rate for girls in the control category was estimated to be 65

TABLE VI

Referral Category

Degree of Curvature	No. of Girls	No. of Girls Currently Monitored by Physicians
0-9°	16 (55%)	9
10-14°	5 (17%)	5
≥ 15°	6 (21%)	6
No x-ray (Examined by physician - no abnormalities)	2 (7%)	-
TOTAL	29 (100%)	20 (69%)

TABLE VII

Sample Size Allocation

Category	Population Size	Sample Size	Sampling Ratios	Estimated Response Rate	Estimated Usable Returns
Negatives	2799	60	1/50	70%	42
Rechecks	283	60	1/5	60%	36
Referrals	29	29	1/1	70%	20
Controls	240	60	1/4	65%	39
TOTAL	3551	209		66.25%	137

percent, the average return rate generally anticipated in mail surveys (Cockerhill, 1984). From the total sub-population size of 3,351 a total sample size of 209 was selected. Given the estimated response rates, the total sample size was estimated to yield approximately 137 usable returns.

In the following sections, the procedures taken to develop and distribute the questionnaire are discussed.

3.2 Questionnaire Development

Following a review of selected literature, published questionnaires and relevant studies were identified for possible use in this study (Canada Health Survey, 1980; Bloom and Monterossa, 1981; Bergman, 1967; Tessler and Mechnic, 1978; Stewart et al, 1976; Coopersmith, 1959; Thorpe et al, 1953). Studies for the most part tended to focus on one specific area of interest and did not simultaneously investigate health perceptions and illness behavior. Questions were also designed to derive information from a population older than 12 years of age and were not geared to the understanding or interests of the early adolescent. It was therefore decided to modify and combine components of available, published questionnaires in order to meet the objectives of this research. In some instances it was necessary to develop questions to elicit information not previously researched. Steps taken to develop the questionnaire are discussed in the following subsections. (Questionnaire available in Appendix C).

Identification of Content:

The selection of relevant content areas was based on discussion with content experts and information identified from published studies and articles.

The research instrument was subsequently designed to investigate information in the following areas:

(a) Health Perceptions: Perceptions focused on : current health, health outlook and health worry/concern (Ware, 1976). These areas were specifically selected to determine if the screening process had compromised personal perceptions of current health, and more importantly, perceptions of health in the future.

(b) Illness Behavior: This area was limited to identifying: school attendance, activity limitations, psychological distress, presence or absence of sickness, and number of days the respondent had spent in bed because of illness.

(c) Confounding Factors: Factors considered significant for this study in providing alternative explanations for perceptions of personal health and illness behavior included: the presence of a health problem that had lasted or was expected to last six months or longer (Bloom and Monterossa, 1981); the incidence of a recent injury (Urberg and Robbins, 1984); and menstruation. Onset of menstruation was considered a relevant factor because of: (1) its association, at this age, with illness behavior and (2) the identifed relationship between spurts of rapid growth which occur around puberty and the potential, at this time, for changes or progression in spinal curves (Liston, 1981; Tanner, 1962). This factor was considered to have the potential to influence representation in the designated screening categories.

A variety of sociodemographic factors have been associated with health status in different studies. In general, these studies indicate that age, education, sex, marital status, ethnicity, income, and educational level of parents influence the rating of health (Pratt, 1971; Tessler and Mechanic, 1978; Bloom and Monterossa, 1981; Bergman and Stamm, 1967). Sociodemographic factors were not explored in this study for the following reasons:

(a) respondents were all female and relatively similar with respect to age and grade level;

(b) factors of ethnicity, occupation and educational level of parents were assumed to be evenly distributed among the sample population through the process of random allocation (Bauman, 1980);

(c) pretesting indicated that respondents, for the most part, were not aware of educational level attained by parents or able to identify specific job classifications; and

(d) it was not considered ethical to obtain information from children about their parents.

Questionnaire Format:

In developing the questionnaire format the attractiveness, clarity, length of the questionnaire, and facility with which data from the questionnaire could be coded and prepared for computer analysis were all considered (Woodward and Chambers, 1982; Levy and Lemenshow, 1980).

The questionnaire was divided into sections representing each study variable: perception of general health; checked for scoliosis; chronic health problems; recent injury; recent illness; days in bed due to recent illness; absence from school due to recent illness; psychological distress; activity limitations; perceptions of current health, health outlook, and health worry/concern; and commencement of menstruation. Items for the most part were presented in a close-ended statement with the respondent required to check the most appropriate response. Questions examining chronic health problems and activity limitations required the respondent to provide information by naming specific health conditions and indicating the length of time an activity had been affected by a particular health problem.

The question exploring commencement of menstruation was placed towards the end of the questionnaire to avoid non-compliance by girls who may be shy or reluctant to co-operate if this item appeared early in the questionnaire.

The last section which asked for general comments was developed to provide respondents with the opportunity to freely express their opinions on the subject matter covered by the questionnaire.

Selection of Questionnaire Items:

1. Health Perceptions: In order to measure perceptions of health, scales developed by Ware (1976) were used. This instrument, which consists of 32 items structured as statements of opinion regarding health, measures eight perceptual dimensions of general health and sick role propensity: prior health, current health, health outlook, resistance/susceptibility to illness, health worry/concern, sickness orientation, rejection of sick role, and attitude toward going to the doctor. For purposes of this study, only the three scales measuring perceptions of current health, health outlook and health worry/concern were used. Each scale consists of statements of opinion accompanied by five response categories: definitely true, mostly true, don't know, mostly false, and definitely false. A score for each of the three health perception scales was computed for each respondent using a simple algebraic sum of scores for items.

Two methods of validation were used by Ware (1976) to judge the validity of the HPQ scales. The first consisted of factor analytic studies of correlations among the scales. Results of the empirical studies of relationships among the eight HPQ scales indicated that each scale score tended to measure the perceptual construct it was intended to measure to a greater extent than it measured other constructs. The constructs included: past/present health, future health and sick role propensity. The second method of validation consisted of studies of the relationships among the scales and other variables that should exist if the scales measured what they are supposed to measure. Relationships between the six HPQ scales hypothesized to measure health (current health, prior health, health outlook, resistance/ susceptibility to illness, sickness orientation, and health worry/concern) and the 11 other health variables studied were strong enough to conclude that the scales measured health and weak enough to indicate that the scales contributed unique information about health. Health perceptions tended to be more unfavorable in conjunction with increases in role activity limitations, bed days, sickness, chronic health problems, pain, and worry. Health perceptions also tended to go hand in hand with psychological well-being and, to a marked degree, with favourable health ratings obtained using a different method. Current health scores were substantially related to both physical health variables (e.g. chronic problems and role activity limitations) and mental health variables (e.g. psychological well-being and worry). Correlations between illness behavior and most HPQ health scales were consistently significant in the hypothesized direction, with correlations often substantial. These results constituted strong support for validity of the HPQ scales as general measures of health.

Internal-consistency reliability for HPQ scales was estimated independently by Ware (1976) in four field tests using Cronbach's alpha coefficient. (Results are summarized in Appendix D). Almost without exception, scale scores were sufficiently reliable for purposes of group comparisons (i.e. coefficient .50; Helmstadter, 1973). In some instances, the current health scale was sufficiently reliable for purposes of individual comparisons, i.e. internal-consistency reliability coefficients 0.90 (Ware, 1976). Only two of the 32 internal-consistency coefficients were below 0.60. Median coefficients (across field tests) ranged from a low of 0.59 for rejection of sick role and sickness orientation scales to a high of 0.91 for the current health scale.

Generalizability of the health perception instrument developed by Ware to this study was appropriate for the following reasons: (1) field testing has indicated the scales are valid, reliable and stable over time for diverse populations; (2) wording was simple and easily understood;

(3) the scales have been validitated to measure perceptions directly related to the focus of this study; and (4) recommendations for uses of the questionnaire specifically included studies designed to explain health and illness behavior.

A measure for general health perceptions, adapted from the Canada Health Survey (1981), was obtained by asking respondents to rate their health in comparison to other girls their age. Choices included: "excellent", "very good", "good", "fair", and "poor".

2. Illness Behavior: Illness behavior focused on school attendance; activity limitations; psychological distress; presence or absence of sickness; and number of days the respondent had spent in bed because of illness. The time frame for measures of school attendance, sickness and days spent in bed due to illness was limited to the three months prior to receiving the questionnaire.

To measure school attendance, each respondent was asked "Have you been absent from school during the last three months because you were sick?" Response alternatives provided were "yes" and "no". If respondents selected "yes" they were asked to indicate the number of days they were absent from school as a result of illness during this time period. Response alternatives included: "2 days or less", "3-5 days", "6-10 days", "11-15 days", "15-20 days", and "more than 4 weeks". Scores were compared among groups for differences.

The measure of activity limitations was composed of items modified from the Canada Health Survey (1981). Respondents were asked if any of their activities were reduced or restricted because of a health problem. Response alternatives for this quetion were "yes" and "no". If respondents selected "yes" they were asked to indicate, from among six choices, which activities had been affected by health problems; to name the main health problems which had caused a change in the way they were able to do any of these activities; and to indicate the length of time these activities had been reduced or restricted.

Two different single-item measures of psychological distress, adapted from the Langner scale (1962), were used on the questionnaire to gain some perspective of the respondent's psychological state. These included a measure of personal happiness ("Most of the time would you say you're very happy, happy, somewhat happy, or very unhappy?") and a measure of nervousness ("Have you been bothered by nervousness, ie. by being irritable, fidgety and tense?"). The response alternatives offered for the nervousness item were "never", "sometimes" and "often". These questions had been used and validated previously by Tessler and Mechanic (1978) in their study on "Psychological Distress and Perceived Health Status".

The measure of sickness, adapted from the Canada Health Survey (1981), was obtained by simply asking respondents if they had been sick during the past three months and if the illness was very serious. Response alternatives to each of these questions required a subjective assessment from the respondent of either "yes" or "no".

The number of days spent in bed because of illness was measured by asking respondents if they had spent all or part of any days in bed during the past three months because they were sick, and if so, to indicate the number of days. Response alternatives included: "2 days or less", "3-7 days", "8-14 days", "15-21 days", "22-28 days", and "more than 4 weeks".

3. Confounding Variables: Confounding variables included the presence of any long term health problems that had lasted or were expected to last six months or longer; incidence of injury during the past three months; and establishing if girls had started to menstruate.

To measure the presence of any chronic conditions, respondents were asked if they had a long term health problem that required them to see a doctor once in a while.

Long term was defined in the question as a condition that had lasted or was expected to last more than six months. Response alternatives provided were "yes and "no". Respondents indicating "yes" were asked to specifically identify their health problem.

The measure of recent injury, adapted from the Canada Health Survey (1981), was obtained by asking respondents if they had been injured at any time during the past three months and if the injury was serious. The response alternatives to each of these questions was "yes" and "no".

To identify girls who had started to menstruate, respondents were asked: "Have you had your first menstrual period?" This question was recently used in a survey conducted by the Edmonton Board of Health (1985) and demonstrated no problems for this specific age group in terms of understanding or response.

Two questions which asked respondents if a doctor or nurse had ever checked their back for curvature of the spine (scoliosis) and if they had been told they have a curvature of the spine (scoliosis) were also included on the questionnaire to identify: (1) girls in the control group who may have been checked and possibly diagnosed with scoliosis and (2) girls initially screened negative by public health nurses who may have been re-examined by a physician and found to have a spinal curve.

Questionnaire Pretest:

An acceptable level of face validity was obtained by reviewing and responding to feedback provided by: 1) individuals invited to examine the draft questionnaire and 2) pretest respondents.

Individuals considered to be knowledgeable in research, scoliosis and adolescent development reviewed the draft questionnaire in terms of content, format, wording, response choices, sequencing of questions, instructions for responding, and how well the questionnaire accomplished study objectives. Weaknesses and concerns regarding the wording of certain questions and instructions were identified, as well as the inappropriateness of asking adolescents to respond to questions concerning their parents. The draft questionnaire was modified in response to the feedback and identified concerns.

A small group of girls, considered representative of the study population, were asked to complete the revised questionnaire and evaluate the length, clarity, and appropriateness of wording and content. This step was particularly important in the development of this questionnaire as it represented the adolescents' understanding, impressions and general acceptance of the questionnaire. In response to their comments, wording was revised and some items deleted with the intent of increasing appeal, clarity of questionnaire items and response rate.

Following discussion with content and research experts on the changes indicated by the pre-test, it was determined that an adequate level of face validity was present and steps were taken to distribute the revised questionnaire (Appendix C) to the sample population.

3.3 Questionnaire Distribution and Data Collection

The following sections describe the questionnaire distribution, follow-up and data collection procedures employed in the study methodology.

Questionnaire Distribution

To facilitate locating girls selected to participate in the study, questionnaires were delivered by public health nurses to the appropriate schools during the week of April 21, 1986. Nurses were given the option of either dropping questionnaires off at the school office or delivering them directly to the student. Information identifying specific schools attended by the sample population was made available by the Edmonton Board of Health and Sturgeon Health Unit. A letter of explanation for parents, signed by the Director of Nursing in each area, accompanied the questionnaire and: (1) explained the purpose of the study, (2) ensured confidentiality, and (3) stressed the importance of having their daughter answer the questions without parental assistance (Appendix A and B). Envelopes containing this information were sealed and addressed to the parent or guardian of the respondents. Questionnaires were to be completed at home and mailed back to the Sturgeon Health Unit or Edmonton Board of Health in a preaddressed, postpaid envelope provided for this purpose by May 2, 1986. Letters, signed by the Medical Officers of Health for the Edmonton Board of Health and Sturgeon Health Unit, were also prepared and forwarded to the appropriate school district to inform officials of the survey and method of implementation (Appendix E, F and G).

Letters to parents and school officials were prepared on the agency's letterhead and signed by the Director of Nursing and Medical Officer of Health in each area to increase the response rate and endorse credibility to the survey project.

Finally, questionnaires were reproduced on colored paper as this factor has been associated with effecting response rate (Woodward, et al. , 1982, p. 24).

Follow-up Procedure:

An accurate identification system for tracking who had responded to the survey and whose questionnaire was outstanding had been established. Each potential respondent was assigned an identification number with the same number placed at the bottom of the first page of the questionnaire sent to that individual. Identification numbers and the corresponding individuals who had not responded were verified and non-respondents telephoned. Non-respondents who did not respond to the first phone call were phoned a second time after which time no further attempts were made to contact the individual. Only three respondents on follow-up stated they did not want to complete the questionnaire. When questionned as to their reason, responses included: (1) "I just don't want to fill it out." (two respondents in the control group) and (2) "I'm not comfortable with the questions."

(respondent in the recheck category). All other girls who were contacted were receptive to being a participant in the study. The follow-up process extended for a period of approximately six weeks at which point it was decided response rates were sufficiently acceptable and no further questionnaires would be included in the data analyses.

Follow-up was effective and produced a substantial increase in the response rate. The return of questionnaires increased approximately 30 percent for the referal group, 20 percent for the negative group, 12 percent for the recheck group, and 27 percent for the control group.

3.4 Data Analyses

This section describes the data analyses strategies utilized to attain the study objectives.

All responses to close-ended statements were coded and stored on a computer file from which to generate statistics. Scores obtained for perceptions of health and illness behavior were considered as interval measurements (Kerlinger, 1973, p.44). Frequency distributions were obtained for the variables of health perceptions, school attendance, activity limitations, psychological distress, presence or absence of sickness, number of days spent in bed because of illness, presence of chronic health problems, incidence of recent injury, commencement of menstruation, and if respondents had been screened for scoliosis. Mean scores were examined between groups and compared using analysis of variance. Differences between groups were adjusted using analysis of covariance. The association between health perceptions and illness behavior scores was measured by Pearson's correlation coefficient and interactions among the variables analyzed with a multiple regression model.

Answers to questions which required respondents to name a specific health problem or indicate the length of time a health problem had affected activities were grouped into general categories and assigned specific codes. Responses to general comments concerning the questionnaire were grouped by type of comment.

Reliability of the questionnaire was established by computing Cronbach's alpha reliability for each of the health perception scales and for the total questionnaire.

3.5 Summary

This chapter discussed the study methodology that was used to develop a mail questionnaire survey and determine the sample population to which it would be distributed. The research strategy, questionnaire development, distribution of the questionnaire, follow-up procedures, and data analysis were reviewed.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Survey Response Rate

Table VIII provides information on the number of questionnaires returned and the response rate for each category.

Of the 209 mail questionnaires distributed, a total of 178 were actually returned representing an overall response rate of 85.8 percent. All questionnaires were considered useable, although, in a few instances portions of questions were not answered.

The overall response rate of 85.8 percent was higher than the anticipated response rate of approximately 66 percent. Information summarized in Table VIII demonstrates that all categories exceeded their anticipated response rate from an additional 12 percent for the negative group to an increase of 30 percent demonstrated by the recheck category. The high response rate suggests: (1) respondents were interested in the study and (2) follow-up procedures, which increased the rate of return by approximately 23 percent, were effective.

TABLE VIII

Response Rate by Category

Category	Anticipated Rate of Return	Rate of Return Prior to Follow-Up	Actual Rate of Return
Referrals	70%	58.6%	89.7%
Rechecks	60%	60%	90%
Negatives	70%	78.3%	81.7%
Controls	65%	53.3%	81.7%
TOTAL:	66.3%	62.5%	85.8%

4.2 Perceptions of Personal Health

To facilitate discussion, respondents' perceptions of personal health have been categorized into: (1) general rating of health; (2) perceptions of current health; (3) perceptions of health worry/concern; and (4) perceptions of health outlook.

General Rating of Health:

Table IX provides a summary of the relative frequency of responses to the rating of general health. Seventy-three percent of all respondents viewed their health as very good or good with 23.6 percent rating their health as excellent and none perceiving it as poor. In examining responses among the groups, results indicated that girls in each of the groups generally rated their health as favourable although 11.5 percent of the referral group perceived their health as fair in comparison to 4.1 percent of the negatives, 2 percent of the controls, and 0 percent of the rechecks. Differences, however, were not significant among groups at the .05 level of significance.

Perceptions of Current Health:

Nine items structured as statements of opinion regarding health were used in this study to measure perceptions of current health.

TABLE IX

Respondents' Perception Of Their General Health

By Category

Categories	Excellent	Very Good	Good	Fair	Poor	Total
Referrals	7 (26.9%)	9 (34.6%)	7 (26.9%)	3 (11.5%)	-	26 (14.6%)
Rechecks	10 (18.5%)	27 (50%)	17 (31.5%)	-	-	54 (30.3%)
Negatives	12 (24.5%)	22 (44.9%)	13 (26.5%)	2 (4.1%)	-	49 (27.5%)
Controls	13 (26.5%)	18 (36.7%)	17 (34.7%)	1 (2%)	-	49 (27.5%)
TOTALS:	42 (23.6%)	76 (42.7%)	54 (30.3%)	6 (3.4%)	-	178 (100%)

The statements and relative frequency of responses for each category surveyed are summarized in Table X. A score for the scale was computed for each respondent using the simple sum of scores for items with higher scores generally indicative of less positive preceptions of current health.

Means computed for the individual groups, as presented in Table XI, averaged: 18.1 for referrals, 16.8 for negatives, 15.6 for rechecks, and 15.2 for controls. The over-all mean ws 16.4 with a standard deviation of 5.7. The minimum score obtained was 9 and the maximum, out of a possible 45 points, was 32. These scores differ considerably from means and standard deviations computed by Ware (1976). The average mean computed in four field tests by Ware (1976) for the current health perception scale was 31.5 with an average standard deviation of 7.9. Since Ware's respondents were adults, the differences in obtained scores seem to suggest that younger age groups present with more positive perceptions of their current health. This would probably reflect the increased incidence of ill health and chronic conditions experienced by an older age group in comparison with younger and relatively healthy adolescents.

Differences were not significant among the referral, recheck, negative, and control groups at the .05 level of significance.

TABLE X

Results by Category for Current Health Scale

Statement of Opinion	Categories	Agree	Disagree	Don't Know
a) According to Doctors I've seen, my health is now excellent.	Referrals	69.3%	3.8%	26.9%
	Rechecks	83.3%	1.9%	14.8%
	Negatives	71.5%	6.1%	22.4%
	Controls	81.7%	2.0%	16.3%
b) I feel better now than I ever have before.	Referrals	46.2%	19.2%	34.6%
	Rechecks	72.2%	9.3%	18.5%
	Negatives	67.3%	10.2%	22.4%
	Controls	63.2%	16.3%	20.4%
c) I am somewhat ill.	Referrals	3.8%	88.5%	7.7%
	Rechecks	5.6%	92.6%	9.9%
	Negatives	4.1%	91.8%	4.1%
	Controls	4.0%	91.9%	4.1%
d) I'm not as healthy now as I used to be.	Referrals	23.1%	57.7%	19.2%
	Rechecks	13.0%	72.3%	14.8%
	*Negatives	10.2%	69.3%	18.4%
	Controls	10.2%	85.7%	4.1%

* 2% – missing data

TABLE X (cont'd)

Results by Category for Current Health Scale

Statement of Opinion	Categories	Agree	Disagree	Don't Know
e) I'm as healthy as anybody I know.	Referrals	69.3%	11.5%	19.2%
	Rechecks	77.7%	3.7%	18.5%
	Negatives	77.6%	8.1%	14.3%
	Controls	81.6%	8.1%	10.2%
f) My health is excellent.	Referrals	80.8%	7.6%	11.5%
	Rechecks	85.2%	1.9%	13.0%
	Negatives	79.6%	8.2%	12.2%
	Controls	81.6%	6.1%	12.2%
g) I have been feeling bad lately.	Referrals	19.2%	80.8%	-
	Rechecks	7.5%	90.8%	1.9%
	Negatives	16.3%	77.6%	6.1%
	Controls	10.2%	85.7%	4.1%
h) Doctors say that I am now in poor health.	Referrals	3.8%	73.1%	23.1%
	Rechecks	-	87.1%	13.0%
	Negatives	-	83.6%	16.3%
	Controls	-	91.9%	8.2%
i) I feel about as good now as I ever have.	Referrals	84.7%	7.7%	7.7%
	Rechecks	68.5%	16.7%	14.8%
	Negatives	73.5%	14.2%	12.2%
	Controls	79.6%	10.2%	10.2%

TABLE XI

Means Obtained by Each Group for the Current Health Scale

Referral Mean	Recheck Mean	Negative Mean	Control Mean	F	Significance Of F
18.1	15.6	16.8	15.2	1.813	0.147

Over-all Mean:	16.4
Std. Dev.:	5.7
Minimum Score:	9.0
Maximum Score:	32.0

This, however, does not rule out the possibility for population differences, as evidenced by an F value of 0.147, and may have been related to the small size of the groups and a relatively large standard deviation of 5.7.

An overall mean of 16.8 obtained by girls who had been screened (referrals, rechecks and negatives) indicated less positive perceptions of personal current health in comparison with a mean of 15.2 obtained by girls in the control group.

In examining responses to individual items it is interesting to note that 23.1 percent of the referral group agreed that they were not as healthy now as they used to be in comparison with 13 percent of the rechecks, 10.2 percent of the negatives and 10.2 percent of the controls. Only 46.2 percent of the referral group agreed they felt better now than ever before compared to 72.2 percent of the rechecks, 63.2 percent of the controls and 67.3 percent of the negative group. However, in response to the statement: "My health is excellent", responses were fairly consistent among the groups with 81 percent of the referrals, 85 percent of the rechecks, 80 percent of the negatives, and 82 percent of the controls in agreement with this comment. Consistent with Ware's interpretation (1976, p. 410), it would appear that the single-item score is less reliable than the scale score for purposes of group comparisons.

Perceptions of Health Outlook:

Four statements of opinion regarding health were used to measure perceptions of health outlook. A summary of the statements and frequency of responses for each category are provided in Table XII.

The over-all mean, as presented in Table XIII, was 7.7 with a standard deviation of 2.6. The minimum score obtained was 4 and the maximum, out of a possible 20 points, was 14. Higher scores were generally indicative of less positive perceptions of health outlook. Mean scores obtained by the individual categories included: 8.2 for the referral group, 7.6 for the rechecks, 7.6 for the controls, and 7.6 for the negative group. Girls who had been screened (referrals, rechecks and negatives) obtained an average mean of 7.8 in comparison with a mean of 7.6 obtained by the control group.

Consistent with current health scores, results were considerably lower than means obtained by Ware (1976) in his administration of the health outlook scale to adults. The average mean obtained by Ware in four field tests was 13.9 with an average standard deviation of 2.6. The less positive perception of future health demonstrated by Ware's adult group may be related to an association proposed by Elkind (1967) between experience with

TABLE XII

Results by Category for Health Outlook Scale

Statement of Opinion	Categories	Agree	Disagree	Don't Know
a) I will probably be sick a lot in the future.	Referrals	11.5%	57.7%	30.8%
	Rechecks	1.9%	61.1%	37.0%
	Negatives	-	53.1%	46.9%
	Controls	2.0%	69.3%	28.6%
b) In the near future, I expect to have better health than other people I know.	Referrals	53.8%	3.8%	42.3%
	Rechecks	48.1%	5.6%	46.3%
	Negatives	49.0%	8.1%	42.9%
	Controls	40.8%	16.3%	42.9%
c) I expect to have a very healthy life.	Referrals	80.8%	3.8%	15.4%
	Rechecks	88.9%	-	11.1%
	Negatives	93.9%	-	6.1%
	Controls	85.7%	-	14.3%
d) I think my health will be worse in the future than it is now.	Referrals	11.5%	53.9%	34.6%
	Rechecks	-	72.2%	27.8%
	#Negatives	2.0%	67.3%	26.5%
	*Controls	6.1%	75.5%	16.3%

* 2% - missing data
# 4.1% - missing data

TABLE XIII

Means Obtained by Each Group for the Health Outlook Scale

Referral Mean	Recheck Mean	Negative Mean	Control Mean	F	Significance Of F
8.2	7.6	7.6	7.6	0.383	0.765

Over-all Mean: 7.7
Std. Dev.: 2.6
Minimum Score: 4.0
Maximum Score: 14.0

ill health and feelings of increased vulnerability to future health problems.

Responses to individual items within this scale indicated that 11.5 percent of the referral group agreed that their health would be worse in the future than at present compared with 0 percent of the rechecks, 2 percent of the negatives, and 6.1 percent of the control group. Over-all, however, groups demonstrated positive expectations for a healthy life (80.8 percent of referrals, 88.9 percent of rechecks, 93.9 percent of negatives, and 85.7 percent of controls). Differences were not significant among the referral, recheck, negative, and control groups for this scale at the .05 level of significance.

Perceptions of Health Worry/Concern:

Four statements of opinion were used in this scale to measure perceptions of health worry/concern. A summary of the statements and frequency of responses for each category are provided in Table XIV.

Means computed for the individual groups, as presented in Table XV, averaged 13.3 for referrals, 13 for rechecks, 13.4 for negatives, and 11.5 for controls. Higher scores were generally indicative of a greater degree of worry and concern regarding

TABLE XIV

Results of Category for Health Worry/Concern Scale

Statement of Opinion	Categories	Agree	Disagree	Don't Know
a) I never worry about my health.	Referrals	34.6%	57.7%	7.7%
	Rechecks	37.1%	53.7%	9.3%
	Negatives	32.6%	53.1%	14.3%
	Controls	55.1%	36.7%	8.2%
b) I worry about my health more than other people worry about their health.	Referrals	38.4%	42.3%	19.2%
	*Rechecks	18.5%	51.8%	27.8%
	Negatives	24.5%	40.8%	34.7%
	Controls	8.2%	61.2%	30.6%
c) My health is a concern in my life.	Referrals	69.3%	26.9%	3.8%
	Rechecks	68.5%	20.4%	11.1%
	#Negatives	69.4%	22.5%	6.1%
	Controls	59.1%	36.8%	4.1%
d) Others seem more concerned about their health than I am about mine.	Referrals	23.1%	46.1%	30.8%
	Rechecks	7.4%	44.4%	48.1%
	Negatives	6.1%	59.2%	34.7%
	Controls	18.4%	40.8%	40.8%

* 1.9% - missing data
# 2% - missing data

TABLE XV

Means Obtained by Each Group for the Health Worry/Concern Scale

Referral Mean	Recheck Mean	Negative Mean	Control Mean	F	Significance Of F
13.3	13	13.4	11.5	3.25	0.023

Over-all Mean: 12.8
Std. Dev.: 3.5
Minimum Score: 5.0
Maximum Score: 20.0

personal health. The over-all mean was 12.8 with a standard deviation of 3.5. The minimum score obtained was five and the maximum, out of a possible 20 points, was 20. These scores are similar to those obtained by Ware (1976). The average mean computed in four field tests by Ware for the health worry/concern scale was 12.1 with an average standard deviation of 2.85.

In comparing the older population used by Ware with young adolescents utilized in this study, it would appear that age, generally associated with experience, influences perceptions of current health and health outlook. The adult group, for the most part, demonstrated more negative perceptions of their current and future health than the young adolescent group. Concern regarding personal health, however, appeared to be an important and relatively constant factor which affected both age groups in a similar manner. These observations, however, can only be interpreted as speculations since different methods were utilized in each study to administer, analyze and interpret the various scales.

Approximately half of respondents in all categories worried about their health with two-thirds indicating that their health represented a concern in their lives. This would seem to indicate that this particular age group, for the most part, are concerned and worried about their health.

In examining responses to individual items, the control group consistently demonstrated less worry and concern regarding personal health than the other groups. In one-way analysis of variance the null hypothesis of no difference among means was rejected at the .05 level of significance. The Scheffe test did not indicate significant differences among group comparisons. However, the value of 7.56 obtained in comparing the negative and control groups compared closely with the critical F value of 7.98. Differences between the referral and control groups would have similarly bordered on significance if the sample size for referrals had been larger. Comparisons made among the other groups produced values considerably lower than the critical F value.

It is interesting to note that the referrals, rechecks and negatives demonstrated more worry and concern regaring their health than displayed by the control group. The over-all mean obtained by girls who had been screened (referrals, rechecks and negatives) was 13.2 in comparison to a mean of 11.5 obtained by the control group. Differences between the means was significant at the .05 level of significance. Further research is indicated in this area to determine if: (1) the screening process has any systematic effect on the obtained results; (2) results occurred by chance; or (3) results were influenced by factors not investigated in this research. The effect of socio-economic factors would be of particular interest since the control group were generally representative of a higher socio-economic level than girls who participated in the screening program.

4.3 Illness Behavior

Information regaring respondents' illness behavior was solicited in relation to identifying: (1) presence or absence of sickness, (2) number of days the respondent had spent in bed because of illness, (3) school attendance, (4) psychological distress, and (5) activity limitations. The distributional characteristics of these items for each group of respondents are presented in this section. The time frame for measures of school attendance, sickness and days spent in bed due to illness was limited to the three months prior to receiving the questionnaire.

Presence or Absence of Illness:

Approximately 64 percent of all respondents identified they had experienced some illness in the past three months. In examining relative frequencies among groups, results were fairly consistent with 69 percent of the referrals, 63 percent of the rechecks, 57 percent of the negatives, and 67 percent of the controls having experienced some illness during the specified time interval. Differences among groups were not significant at the .05 level of significance.

Only 2.2 percent of respondents indicated that their illness had been serious. Representation included 3.8 percent of the referrals, 3.7 percent of the rechecks and 2 percent of the negative group. Differences were not significant among the groups at the .05 level of significance.

Days in Bed as a Result of Illness:

Forty-seven percent of all respondents indicated they had spent some amount of time in bed during the past three months as a result of illness with 52 percent indicating they had not. Differences were not significant among groups. Affirmative responses to this question within the groups ranged from 53 percent of the referrals and controls to 46 percent of the rechecks and 39 percent of the negative group.

The average number of days spent in bed due to illness was 4.8 days with a standard deviation of 3.4. Only 2.8 percent of all respondents were confined to bed for more than seven days.

Absence From School as a Result of Illness:

Fifty-four percent of all respondents indicated they had been absent from school during the last three months as a result of illness. Responses indicating absenteeism from school due to illness were fairly consistent among the groups (54 percent of the referrals, 56 percent of the rechecks, 51 percent of the negatives, and 57 percent of the controls) with no significant differences at the .05 level of significance.

The average number of days absent from school as a result of illness was 4.4 days with a standard deviation of 3.3. Only 6.2 percent of all respondents were absent from school for more than five days. It is interesting to note that the referral and control groups comprised the largest proportion of respondents absent from school for more than five days. Differences, however, were not significant among groups at the .05 level of significance.

Psychological Distress:

Two different single-item measures of psychological distress, adapted from the Langner Scale (1962), were used to gain some perspective of the respondent's psychological state. These included: (1) a measure of personal happiness and (2) a measure of nervousness. The frequency distribution of responses for these items will be discussed separately.

Rating of Happiness:

Eighty-five percent of all respondents indicated they were very happy or happy with only 1.7 percent choosing to select the very unhappy response. Results were fairly consistent among the groups with 88.4 percent of the referrals, 83.3 percent of the rechecks, 85.7 percent of the negatives, and 85.7 percent of the controls rating themselves as very happy or happy.

Rating of Nervousness:

Sixty-eight percent of all respondents indicated they were never bothered by nervousness, 23 percent indicated they were sometimes bothered by nervousness and approximately eight percent indicated they were often bothered by nervousness. A summary of the frequency of responses for each category is provided in Table XVI.

Means obtained for the individual groups averaged 1.88 for the referrals, 1.83 for the rechecks, 2.12 for the negatives, and 1.67 for the controls. Higher scores were indicative of a greater degree of nervousness. Of interest, the average mean

TABLE XVI

Rating of Nervousness by Each Group

Category		Rating of Nervousness		
	Never	Sometimes	Often	
Referrals	15.4%	76.9%	7.7%	
Rechecks	25.9%	64.8%	9.3%	
Negatives	16.3%	67.3%	14.3%	* 2% Indicated "did not know"
Controls	30.6%	67.3%	-	* 2% missing data

obtained by girls who had been screened (referrals, rechecks and negatives) was 1.9 in comparison with a mean of 1.67 obtained by the control group. Differences among these means was significant at the .05 level of significance.

In one-way analysis of variance the null hypothesis of no difference among means was rejected at the .05 level of significance. The Scheffe test indicated significant differences between the negative and control groups and the negative and recheck groups. It is probable that differences would have also been significant between the negative and referral groups if sample size had been larger for the referral group. The fact that significant differences occurred in such small sample sizes indicates that differences in the rating of nervousness among the groups may be quite large. The occurrence of a Type I error is a possibility that should also be considered.

In the preliminary study (Johnston, 1985), significant differences did not occur among the normal, recheck and referral groups in response to questions which inquired about stress experienced by the student during scoliosis screening. The significance of the negative group demonstrating a greater degree of general nervousness requires further investigation.

Activity Limitations

Only 14 percent of all respondents indicated that some of their activities were reduced or restricted because of a health problem. It is of interest to note that 26.9 percent of the referrals indicated a reduction or restriction of their activities in comparison to 7.4 percent of the rechecks, 16.3 percent of the negatives and 12.2 percent of the controls. Differences, however, were not significant among groups at the .05 level of significance.

An over-view of activities, percentage of respondents affected for each activity, contributing health problems, and a breakdown of categories affected is presented in Table XVII. Asthma and bone and joint difficulties were the two most frequent health problems indicated by respondents. The condition of scoliosis was mentioned only once in relation to limiting a respondent's ability to do sit-ups. The respondent belonged to the referral group and had been x-rayed for a 10 degree curve in June, 1985. The length of time the activity of doing sit-ups had been limited by scoliosis was not clearly indicated by the respondent.

According to the results obtained, it would appear that scoliosis was perceived to cause few limitations in respondents' abilities to perform various activities.

TABLE XVII

Activity Limitations

Activity	% of Respondents Affected	Health Problem	Categories Affected
1. Housework	0.6% (1)	Asthma	Referral (1)
2. Recreational Activities (such as skiing, skating, swimming, golfing, bicycling, etc.)	6.8% (12)	Asthma	Referral (2) Negative (2)
		Epilepsy	Control (1)
		Bone & Joint	Referral (3) Recheck (1) Control (1)
		Aches & Pains	Referral (1) Control (1)
		Injuries	Referral (1)

TABLE XVII (cont'd)

Activity	% of Respondents Affected	Health Problem	Categories Affected
3. Team Sports (such as basketball, volleyball, baseball, etc.)	7.3% (13)	Asthma	Referral (2) Negative (2)
		Bone & Joint	Referral (3) Recheck (2) Control (1)
		Infections	Control (1)
		Aches & Pains	Control (1)
		Injuries	Recheck (1)
4. Dancing	2.2% (4)	Asthma	Referral (1)
		Bone & Joint	Referral (1) Recheck (1) Control (1)
5. Jogging or Running	11.8% (21)	Allergies	Negative (1)
		Asthma	Referral (2) Recheck (1) Negative (2) Control (1)

TABLE XVII (cont'd)

Activity	% of Respondents Affected	Health Problem	Categories Affected
5. Jogging or Running (Continued)		Bone & Joint	Referral (3) Recheck (2) Negative (3) Control (2)
		Infections	Control (1)
		Aches & Pains	Referral (1) Negative (1) Control (1)
6. Other	1.7% (3)		
a) Sit ups and Related Activities	(0.6%)	Back Problem (Scoliosis)	Referral (1)
b) Gym	(0.6%)	Taking Medication	Negative (1)
c) Stretching	(0.6%)	Aches & Pains (Back)	Control (1)

4.4 Testing of Study Hypotheses

The major hypotheses underlying this study included: (1) favourable health perceptions will be negatively associated with increases in absenteeism, illness, sick days, psychological distress, and activity limitations; (2) there will be no differences in perceptions of personal health and illness behavior between the control group and the negative group; (3) differences in perceptions of personal health and illness behavior will be demonstrated between the referral-recheck groups and the control-negative groups; (4) differences in perceptions of personal health and illness behavior will be demonstrated between the referral group and the recheck group; (5) differences in perceptions ~~of personal~~ health and illness behavior will be demonstrated between girls screened for scoliosis (referrals-rechecks-negatives) and the control group; and (6) there is a relationship between being labeled with scoliosis and demonstrating less positive perceptions of personal health and illness behavior.

Under the assumption that the sample was randomly selected and representative of the study population, the "t-test" was considered the most appropriate statistical analysis to test hypotheses which examined differences among the groups (Bauman, 1980). The Mann-Whitney U test, used to analyze non-parametric data, validated results obtained in the "t-test" (Downie and Heath, 1974).

Analyses indicated that differences in perceptions of personal health and illness behavior were not statistically significant between: (1) the referral and recheck groups and (2) the referral-recheck groups and the negative-control groups. These hypotheses were consequently rejected at the five percent level. A difference of no more than ten percent between the means on most measures indicated: (1) sample sizes were large enough and (2) important differences, for the most part, were unlikely missed due to inappropriate sample size (Armitage, 1971, pp. 184-188). Results of the analyses are presented in Tables XVIII and XIX.

Analytic comparison of the negative and control groups indicated statistically significant differences on the measures of: (1) nervous rating and (2) worry/concern in relation to personal health. Similar results were obtained for analysis which compared girls screened for scoliosis (referrals, rechecks and negatives) with the control group. The null hypothesis of no difference in perceptions of personal health and illness behavior between the control and negative groups was rejected at the five percent level. The hypothesis proposing differences in perceptions of personal health and illness behavior between girls

TABLE XVIII

Analytic Comparison for Perceptions of Health and Illness Behavior Between the Referral and Recheck Groups

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Recent Illness	Referrals	26	1.31	.471	.092	-0.54	.588
	Rechecks	54	1.37	.487	.066		
Days in Bed From Illness	Referrals	26	1.46	.508	.100	-0.63	.533
	Rechecks	54	1.54	.503	.068		
Absent From School	Referrals	26	1.46	.508	.100	0.43	.667
	Rechecks	54	1.41	.533	.072		
Happiness Rating	Referrals	26	1.85	.613	.120	-0.03	.973
	Rechecks	54	1.85	.737	.100		
Nervous Rating	Referrals	26	1.92	.484	.095	0.69	.494
	Rechecks	54	1.83	.575	.078		
Activity Limitation	Referrals	26	1.73	.452	.089	-1.12	.265
	Rechecks	54	1.85	.452	.061		
General Rating Of Health	Referrals	26	2.23	.992	.195	0.53	.601
	Rechecks	54	2.13	.702	.095		

TABLE XVIII (Cont'd)

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Current Health	Referrals	26	18.1	6.63	1.30	1.72	.090
	Rechecks	54	15.6	5.56	.757		
Worry/Concern Re Health	Referrals	26	13.3	4.25	.834	0.42	.673
	Rechecks	54	13.0	2.95	.401		
Future Health	Referrals	26	8.19	2.94	.577	0.93	.354
	Rechecks	54	7.57	2.7	.367		

Probabilities Calculated Using the Student's T-Test Were Collaborated Using the Mann-Whitney U Test.

TABLE XIX

Analytic Comparison for Perceptions of Health and Illness Behavior Between the Referrals-Rechecks and Negatives-Controls

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Recent Illness	Ref-Rechecks	80	1.35	.48	.05	-0.10	.92
	Neg-Controls	98	1.35	.50	.05		
Days In Bed From Illness	Ref-Rechecks	80	1.51	.503	.056	-0.10	.919
	Neg-Controls	98	1.52	.522	.053		
Absent From School	Ref-Rechecks	80	1.42	.522	.058	-0.18	.861
	Neg-Controls	98	1.44	.519	.052		
Happiness Rating	Ref-Rechecks	80	1.85	.695	.078	0.59	.553
	Neg-Controls	98	1.79	.736	.074		
Nervous Rating	Ref-Rechecks	80	1.86	.545	.061	-0.22	.829
	Neg-Controls	98	1.89	.918	.093		
Activity Limitation	Ref-Rechecks	80	1.81	.453	.051	-0.74	.460
	Neg-Controls	98	1.89	.918	.036		
General Rating Of Health	Ref-Rechecks	80	2.16	.803	.09	0.41	.68
	Neg-Controls	98	2.11	.82	.08		

TABLE XIX (Cont'd)

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Current Health	Ref-Rechecks Neg-Controls	80 98	16.4 16.0	5.99 5.40	.670 .546	0.50	.618
Worry/Concern Re Health	Ref-Rechecks Neg-Controls	80 98	13.1 12.5	3.40 3.55	.380 .358	1.23	.222
Future Health	Ref-Rechecks Neg-Controls	80 98	7.77 7.62	2.77 2.43	.310 .245	0.39	.696

Probabilities Calculated Using the Student's T-Test Were Collaborated Using the Mann-Whitney U Test.

screened for scoliosis and the control group was not rejected at the five percent level. Results are presented in Table XX and Table XXI. In interpreting these results it is important to consider that chance, or the influence of factors not investigated in this research, may have affected the outcome of results. Further research is indicated to obtain additional information which will facilitate interpretation of these results.

Analysis, presented in Table XXII, indicates that, as hypothesized, a relationship may exist between being labeled with scoliosis and demonstrating less positive perceptions of personal health and illness behavior. Girls who "perceived" they had been told there was something wrong with their back demonstrated significantly less positive perceptions of their current health and health outlook than girls who indicated they had been told nothing was wrong with their back. It is interesting to note that differences were almost significant (.057) on the measure for activity limitations when more restrictions in personal activities were demonstrated by the group of girls who indicated they had been told they had a curvature of the spine in comparison with girls who had not. These results are of particular interest in view of the small percentage of girls who actually have a spinal curve of any significant degree. Within this study, 61 percent of the referral group had minimal curves which were less than or equal to ten degrees. These results suggest that a "negative Labeling effect" may occur. Further

TABLE XX

Analytic Comparison for Perceptions of Health and Illness Behavior Between the Negative and Control Groups

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Recent Illness	Controls	49	1.29	.500	.071	-1.41	.161
	Negatives	49	1.43	.500	.071		
Days in Bed From Illness	Controls	49	1.43	.540	.077	-1.76	.082
	Negatives	49	1.61	.492	.070		
Absent From School	Controls	49	1.39	.533	.076	-0.97	.333
	Negatives	49	1.49	.505	.072		
Happiness Rating	Controls	49	1.80	.735	.105	0.14	.892
	Negatives	49	1.77	.743	.106		
Nervous Rating	Controls	49	1.65	.522	.075	-2.60	*.011
	Negatives	49	2.12	1.15	.164		
Activity Limitation	Controls	49	1.88	.331	.047	0.57	.568
	Negatives	49	1.84	.373	.053		
General Rating Of Health	Controls	49	2.12	.832	.119	0.12	.903
	Negatives	49	2.10	.823	.118		

TABLE XX (Cont'd)

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Current Health	Controls	49	15.2	5.30	.757	-1.45	.151
	Negatives	49	16.8	5.44	.778		
Worry/Concern Re Health	Controls	49	11.5	3.61	.516	-2.83	*.006
	Negatives	49	13.4	3.23	.461		
Future Health	Controls	49	7.6	2.5	.35	-0.04	.967
	Negatives	49	7.6	2.4	.34		

* $p \leq .05$

Probabilities Calculated Using the Student's T-Test Were Collaborated Using the Mann-Whitney U Test.

TABLE XXI

Analytic Comparison for Perceptions of Health and Illness Behavior Between Referral-Recheck-Negative Groups and the Control Group

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Recent Illness	Screened	129	.62	.487	.043	-0.66	.512
	Control Group	49	.67	.474	.068		
Days in Bed From Illness	Screened	129	4.43	3.35	.295	0.43	.664
	Control Group	49	4.18	3.26	.466		
Absent From School	Screened	129	.535	.501	.044	-0.44	.664
	Control Group	49	.571	.500	.071		
Happiness Rating	Screened	129	1.822	.712	.063	0.21	.831
	Control Group	49	1.796	.735	.105		
Nervous Rating	Screened	129	1.961	.833	.073	2.41	*.017
	Control Group	49	1.653	.522	.075		
Activity Limitation	Screened	129	.147	.356	.031	0.42	.672
	Control Group	49	.122	.331	.047		
General Rating Of Health	Screened	129	2.14	.808	.071	0.13	.901
	Control Group	49	2.12	.832	.119		

TABLE XXI (Cont'd)

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Current Health	Screened Control Group	129 49	16.57 15.22	5.77 5.30	.508 .757	1.42	.156
Worry/Concern Re Health	Screened Control Group	129 49	13.24 11.49	3.33 3.61	.293 .516	3.06	*.003
Future Health	Screened Control Group	129 49	7.72 7.61	2.63 2.47	.232 .353	.25	.803

* $p \leq .05$

Probabilities Calculated Using the Student's T-Test Were Collaborated Using the Mann-Whitney U Test.

TABLE XXII

Analytic Comparison for Perceptions of Health and Illness Behavior Between Girls Who Indicated They Had Been Told They Had Scoliosis and Girls Who Had Not

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Recent Illness	Yes	49	.71	.46	.065	1.28	.204
	No	110	.61	.49	.047		
Days in Bed From Illness	Yes	49	4.4	3.2	.465	-0.07	.945
	No	110	4.4	3.4	.322		
Absent From School	Yes	49	.57	.50	.071	0.62	.537
	No	110	.52	.50	.048		
Happiness Rating	Yes	49	1.98	.69	.099	1.48	.141
	No	110	1.8	.71	.068		
Nervous Rating	Yes	49	1.8	.51	.073	-0.60	.551
	No	110	1.9	.89	.085		
Activity Limitation	Yes	49	.22	.42	.060	1.92	.057
	No	110	.11	.31	.030		
General Rating Of Health	Yes	49	2.2	.85	.121	1.14	.254
	No	110	2.1	.80	.077		

TABLE XXII (Cont'd)

Variable	Categories	Number Of Cases	Mean	Standard Deviation	Standard Error	T Value	2-Tail Probability
Current Health	Yes	49	18.2	6.3	.894	2.74	*.007
	No	110	15.5	5.2	.497		
Worry/Concern Re Health	Yes	49	13.0	3.2	.457	.68	.495
	No	110	12.6	3.6	.348		
Future Health	Yes	49	8.5	2.7	.392	2.20	*.029
	No	110	7.5	2.5	.234		

* $p \leq .05$

Probabilities Calculated Using the Student's T-Test Were Collaborated Using the Mann-Whitney U Test.

research in the area of labeling is indicated and should focus on: (1) investigating the influence of variables associated with affecting perceptions of health and illness behavior not investigated in this study and (2) replicating the study outside of the population surveyed.

Pearson Correlation Coefficients: Illness Behavior and Perceptions of Health

Results regarding correlations between the illness behavior variables and health perception variables are summarized in Table XXIII. As hypothesized, favourable health perceptions were negatively associated with increases in recent illness, activity limitations, nervousness, unhappiness, absence from school, and days in bed as a result of illness. The measure of happiness, a positive behavioral variable, was associated with more favourable perceptions of health and a lesser degrees of worry/concern in relation to one's own health. Results, for the most part, were only insignificant when associated with measures for nervousness and worry/concern in relation to personal health.

The results obtained in the Pearson's correlation analyses are consistent with some of the findings reported by Ware (1976, p. 411). His results, as well, indicated that health perceptions tended to be more unfavourable in conjunction with increases in

TABLE XXIII

Summary of Pearson Correlation Coefficients in Relation to Illness Behavior and Perceptions of Health

Illness Behavior Variables	Health Perception Variables Current Health	 Future Health	 Worry/Concern Re Health	 General Health
Recent Illness	-.1579 *p=.018	-.1583 *p=.017	-.0158 p=.417	-.1061 *p=.079
Activity Limitations	-.4197 *p=.000	-.2407 *p=.001	-.2230 *p=.001	-.2626 *p=.000
Nervousness	.1868 *p=.006	.0431 p=.284	.1128 p=.067	.0087 p=.454
Happiness	.4381 *p=.001	.3353 *p=.000	.0249 p=.371	.2082 *p=.003
Absence From School As a Result of Illness	-.2298 *p=.001	-.1358 *p=.035	-.1136 p=.066	-.1659 *p=.013
Days in Bed as a Result of Illness	-.2582 *p=.000	-.1648 *p-.014	-.0910 p=.114	-.1684 *p=.012

*$p \leq .05$

role activity limitations, bed days, sickness, chronic health problems, pain, and worry. He further reported that current health scores are substantially related to both physical health variables (eg. chronic problems and role activity limitations) and mental health variables (eg. psychological well-being and worry).

It would appear that the results obtained in this analysis are: (1) consistent with findings reported in Ware's study, (2) represent logical outcomes, (3) provide further support for validity of the health perception scales as general measures of health, and (4) support not rejecting the proposed hypothesis at the five percent level.

4.5 Confouding Factors

This section will present the relative frequency of responses for the confounding variables considered significant for inclusion in this study.

Chronic Health Problems: Only 16.3 percent of all respondents indicated they had any long term health problems that required them to see a doctor once in awhile. Of this number, only one respondent from the referral group indicated more than one long term health condition. The distribution of chronic problems, grouped into the appropriate categories following interpretation of information provided by respondents, is presented in Table XXIV. Bone and joint problems (shin splints, knee and ankle problems) and asthma, were the most common long term health problems reported by respondents. Only four respondents, one from the control group and three from the referral group, indicated back problems with two of the girls from the referral group specifically naming scoliosis. Both girls were being seen on a regular basis by family physicians and had curves which measured 11 degrees and eight degrees on x-ray. The third girl from the referral group who indicated back problems had a two degree curve and was also being seen on a regular basis by her family physician. The respondent from the control group indicated she experienced back pains which according to other information obtained from the questionnaire did not appear to be associated with a diagnosis of scoliosis.

It is interesting to note that referrals had the highest proportion of chronic problems for their group (30.8 percent) compared with 13 percent for the rechecks and 14.3 percent for the negative and control groups. The small number of referrals in comparison to the other groups is an important factor which needs to be considered in interpreting this result.

TABLE XXIV

Chronic Health Problems by Group

Chronic Health Problem	# Per Group Referrals	Rechecks	Negatives	Controls
Allergies (4)		1	2	1
Asthma (5)	2	1	2	
Diabetes (1)				1
Kidney Disease (1)			1	
Back Problems (4)	3			1
Epilepsy (1)				1
Bone & Joint (6)	2	2	1	1
Recurring Infections (4)	1	1		2
Aches & Pains (2)		1	1	
Injuries (1)		1		
TOTALS (29)	8 *(30.8%)	7 *(13%)	7 *(14.3%)	7 *(14.3%)

* Refers to Percentage of Group

Recent Injury: Nineteen percent of respondents indicated they had been injured during the past three months with only one percent indicating the injury had been serious. Responses indicating a recent injury were fairly consistent among the referrals (23.1 percent), rechecks (24.1 percent) and controls (20.4 percent) with only 10.2 percent of the negative group reporting an injury. Differences were not significant among groups.

Menstruation: In response to the question which asked respondents if they had their first menstrual period: 50.6 percent responded yes, 48.3 percent responded no and .6 percent indicated they did not know.

These results compare favourably with data recently analyzed by the Edmonton Board of Health (1986) for a survey which was specifically designed to determine the average age of menarche for girls in the city of Edmonton. The average age of menarche was estimated to be 12.66 years with the range calculated between 12.5 and 12.8 years (95 percent confidence limits). Analysis was based on survey results obtained from 1,832 girls, ages 10 to 16 years, who were randomly selected to participate in the study. Further analysis which determined the percentage of girls menstruating by age and grade indicated that 52.1 percent of girls in grade seven had started to menstruate and 47.9 percent had not.

This compared similarly with results obtained in this study where 50.6 percent of girls in grade seven were determined to be menstruating. Results were fairly consistent among the groups with 57.7 percent of the referrals, 46.3 percent of the rechecks, 59.2 percent of the negatives, and 42.9 percent of the controls indicating they had started to menstruate. These results would seem to indicate that any influences exerted by this factor were evenly distributed among the groups.

Previously Screened for Scoliosis: All respondents in the referral, recheck and negative categories had been screened for scoliosis by public health nurses with the Edmonton Board of Health.

Thirteen or 26.5 percent of the control group indicated that a doctor or nurse had checked their back for a curvature of the spine with two respondents (4.1 percent) indicating they were told they had scoliosis. Due to the sizeable number, control respondents who indicated they had been screened were compared with control respondents who had not been screened on the perceptions of general health measure. Differences were not statistically significant at the .05 level of significance (.823). The large significance value obtained on this measure suggests that having been checked previously for scoliosis, in all likelihood, did not systematically affect differences within the control group.

Diagnosed with Scoliosis: Forty-six percent of the rechecks indicated they had been told they had scoliosis with 20 percent indicating they "didn't know'. Without x-ray confirmation it is not possible to confirm if almost half of the rechecks actually have a curvature of the spine. It would seem doubtful, however, that such a high percentage of girls would actually have spinal curves of any significant degree. Of the 80.8 percent of referrals who reported a curvature of the spine, approximately 72 percent of this group actually have curves which have been confirmed by x-ray or physician assessment. Sixty-one percent of these curves were measured at ten degrees or less. Two respondents or 4.1 percent of the control group and two percent of the negative group indicated they were told they have a curvature of the spine.

4.6 Multiple Regression Analysis

From the literature review, it was apparent that a number of factors likely influence perceptions of personal health and illness behavior. In this analysis only the influence of chronic health problems, menstruation, previous injury, screened for scoliosis, and diagnosed with scoliosis were investigated.

A step-wise multiple regression model was used as a descriptive tool in order to assess the relative contribution of each of the aforementioned independent variables to the explanation of variation in specified dependent variables (recent illness; bed days as a result of illness; absence from school; perceptions of happiness and nervousness; activity limitations; and perceptions of general health, current health, health outlook, and worry/concern in relation to personal health).

In step-wise regression, a minimum level of significance, as evidenced by the partial F values, is required before a variable is allowed to enter the equation. In addition, a minimum level of significance is required to retain a variable in the equation after it has been entered. The introduction of an additional variable may cause one or more of the variables entered previously to be eliminated from the equation. Thus, the selection procedure requires the identification of any variables that have dropped below the minimum level of significance. If any of the variables fail to achieve the specified level of significance, they are removed before proceeding to introduce a new variable into the equation. This variable must have the highest squared partial correlation and exceed the required level of significance. The objective of step-wise regression is to select all, but only, those variables which exceed the specified level of statistical significance as evidenced by the partial F test (Colin and Broyles, 1980, pp. 326-327). Results of the regression analyses are presented in Table XXV.

Summary of Findings:

Perceptions of General Health: Previous injury and menstruation were significantly associated with perceptions of general health and, together, accounted for approximately seven percent of the variation in the perceptions of general health variable. Positive perceptions in regard to general health were significantly related with: (1) no recent injuries and (2) not having started to menstruate.

Perceptions of Current Health: Diagnosed with scoliosis was the only independent variable to demonstrate significance and explained approximately four percent of the variability exhibited by the perceptions of current health variable. More favourable perceptions of ones' current health was significantly related with not having been diagnosed with scoliosis.

Perceptions of Health Outlook: Diagnosed with scoliosis and previous injury were significantly associated with affecting perceptions of health outlook and, in combination, accounted for approximately nine percent of the variability for this dependent variable. More favourable perceptions of health outlook were significantly related with: (1) no recent injuries and (2) not having been diagnosed with scoliosis.

TABLE XXV

Summary of Regression Analysis

Dependent Variables	Significant Independent Variables	B	Beta	R Square	P
A. Perceptions of General Health	1. Previous Injury 2. Menstruation	-.3709 -.2660	-.2088 -.1714	.072	.0014
B. Perceptions of Current Health	1. Diagnosed With Scoliosis	-1.92	-.2023	.041	.0068
C. Perceptions of Health Outlook	1. Diagnosed With Scoliosis 2. Previous Injury	-1.02 -1.08	-.2348 -.1919	.092	.0002
D. Recent Illness	1. Previous Injury	.166	.1549	.024	.0390
E. Bed Days as a Result of Illness	1. Previous Injury	.207	.1851	.034	.0134
F. Absence From School	1. Menstruation 2. Previous Injury	-.218 .168	-.2196 .1477	.071	.0016
G. Happiness Rating	1. Diagnosed With Scoliosis 2. Screened for Scoliosis	-.275 .206	-.2292 .1649	.063	.0034

Recent Illness: Previous injury was the only independent variable to demonstrate significance and explained approximately two percent of the variability for this dependent variable. The occurrence of injuries was significantly associated with recent illness.

Bed Days as a Result of Illness: Previous injury ws significantly associated with days in bed due to illness and explained approximately three percent of the variability exhibited by bed days. Injuries were significantly related with days spent in bed.

Absence From School: Menstruation and previous injury were significantly related to absence from school and, in combination, accounted for approximately seven percent of the variability for this dependent variable. Increased absence from school was significantly related to: (1) injuries and (2) not having started to menstruate.

Perceptions of Happiness: Diagnosed with scoliosis and screened for scoliosis were significantly associated with perceptions of happiness and, together, explained approximately six percent of the variance exhibited by this variable. A greater degree of perceived happiness was significantly related to: (1) having been screened for scoliosis and (2) not having been diagnosed with scoliosis.

A minimum level of significance was not demonstrated by any of the selected independent variables for measures of activity limitations, worry/concern in regard to personal health or perceptions of nervousness. When group was entered as a variable, the only measure significant at the five percent level was the rating of nervousness. This finding is consistent with previous results where the negative group was found to demonstrate a greater degree of general nervousness in relation to the other groups.

Findings generally indicate that menstration, previous injury, and diagnosed or being told one has scoliosis are significantly associated with certain perceptions of health and illness behavior.

4.7 General Comments

Respondents were given the opportunity to comment on any aspect of the questionnaire. Comments are highlighted in this section with actual edited comments presented in Appendix H.

Sixty-four percent of the respondents did not respond to this item. The remaining 36 percent of respondents offered comments that included: (1) indicating they had liked the questionnaire; (2) inquiring as to why and how they had been chosen to participate in the study; (3) inquiring about specific health and menstrual problems they were experiencing; (4) indicating they would like to obtain more information on scoliosis; (5) clarifying answers they had provided in response to specific questions; and (6) commenting on the importance of learning about scoliosis.

Of particular interest were comments provided by five girls in the recheck and referral groups. Two girls from the referral category and one from the recheck group indicated that their scoliosis did not cause them any concern or restrict their activities. Two other girls from the recheck group, however, commented that their scoliosis: (1) may have been caused by daily skating and (2) seemed to be the cause of frequent tiredness and colds.

Although comments provided by those who responded were, for the most part positive, it would appear that a few girls have misconceptions in relation to scoliosis. This is consistent with results obtained in the preliminary survey (Johnston, 1985).

4.8 Reliability

Generally speaking, reliability refers to consistency and, as such, is a necessary condition in any measurement instrument (Campbell, 1976; Kerlinger, 1973). It is that part of test variance which is free of measurement error variance and is "dependent upon agreement between two maximally similar methods of measuring that same trait" (Craig, 1975, p. 17). For the purpose of this study, Cronbach's alpha (Cronbach, 1951) was used as the method for determining internal consistency (reliability).

Reliability using this method can be estimated from a single administration of the instrument and is frequently sought for instruments used in short-term projects. Item responses are correlated between all possible splits of the entire instrument, with the coefficient representing the average reliability of the measures obtained from all possible subdivisions of the instrument. A high correlation coefficient from this method indicates that the test has homogeneous test items, which suggests that subjects would score about the same on any given sample of the test items.

A Cronbach's alpha reliability of .7 was obtained for the total questionnaire. This result indicates that all items within the questionnaire were answered with a fairly high degree of consistency.

In measuring the individual health perception scales, a Cronbach's alpha reliability of .82 was obtained for the current health scale, .65 for the health outlook scale, and .64 for the health worry/concern scale. As demonstrated in Table XXVI, reliability coefficients obtained for the health perception scales in this study compare similarly with results obtained by Ware (1976).

4.9 Summary

The results of the analyses obtained from the questionnaire were presented and discussed in this chapter. Open-ended comments were categorized and general comments highlighted. The findings and conclusions of the analyses and subsequent recommendations are presented in the following chapter.

TABLE XXVI

Comparison of Cronbach's Alpha Reliability Coefficient in Two Studies

Scale	No. of Items in Scale	Internal-Consistency Coefficient: Ware's Study (1976)	Internal-Consistency Coefficient: Scoliosis Study (1986)
Current Health	9	.91	.82
Health Outlook	4	.75	.65
Health Worry/Concern	4	.60	.64

CHAPTER V

SUMMARY AND RECOMMENDATIONS

In Chapter V, a summary of the study is presented, major findings and conclusions based upon data analysis are discussed, and recommendations are set forth.

5.1 Summary of the Study

Since 1955 almost two million children have been examined for the presence of scoliosis. Yet, controversy still exists regarding the utility and effectiveness of school screening for scoliosis. It is viewed by some as an essential tool for the prevention of severe spinal deformities; while others have stated that it is a waste of scarce and valuable resources. A review of selected literature indicated that data generated on scoliosis screening, to date, has generally failed to clarify issues central to establishing the efficacy of the program. While the literature contained several quantitative and descriptive studies attempting to provide further information and clarification on the natural history of scoliosis, efficacy of treatment methods and validity of the screening procedure, research examining potential psychological effects of the scoliosis screening process on the adolescent girl was limited. The lack of information and investigation in this particular area was considered to represent a significant void in view of the deficit of information which characterizes the program, high false-positive rates, the particularly vulnerable age when screening occurs, limited research available on the implications associated with labeling, and the stress and misconceptions in relation to screening and scoliosis which were demonstrated by adolescent girls in a preliminary study. This research was undertaken to gain some perspective on the implications associated with the diagnostic labeling of adolescent girls with scoliosis. More specifically, the study was designed to determine if adolescent girls who were screened and referred for x-ray and physician assessment (referrals), or re-examination in six months by a public health nurse (rechecks), differed in perceptions of personal health and illness behavior from girls who had been screened and designated negative. Results of the study could potentially provide additional knowledge in the area of scoliosis screening which could be of use to health care administrators and researchers in evaluating and understanding the full impact of scoliosis screening programs on young adolescents.

Following a revelw of selected literature, published questionnaires and relevant studies were identified for possible use in this study. Studies for the most part tended to focus on one specific area of inquiry and did not simultaneously investigate health perceptions and illness behavior. Questions were also designed to derive information from a population older than 12 years of age and were not geared to the understanding or interest of the early adolescent. These limitations necessitated the development of a research strategy and instrument which would address the specific objectives of this study.

The data collection method selected to obtain information from the study population was the mail questionnaire survey. For the purposes of this research, the target population was defined as all girls who had been screened for scoliosis by the Edmonton Board of Health. To maintain consistency and ensure reasonable ease of access to respondents, the study population was limited to girls who had been screened for scoliosis by the Edmonton Board of Health in the spring of 1985. Three categories are differentiated by Edmonton in their screening process: girls with no observable form of scoliosis (normal); girls with a questionable or small deviation who are re-examined at six month intervals by public health nurses (rechecks); and girls with an obvious deviation who are referred by public health nurses for x-ray and examination by a physician (referrals). Girls were selected from each of these designated screening categories to determine if differences existed among the groups. From a total of 3,111 girls screened in the spring of 1985, 149 were selected to participate in the study. This number was comprised of 60 girls randomly selected from each of the recheck and negative groups and all 29 girls from the referral group. Sixty girls who resided outside of Edmonton and within the boundaries of a health unit which did not provide scoliosis screening were randomly selected as a control group. From a total study population size of 3,351 adolescent girls, a total sample size of 209 was selected.

Available, published questionnaires were modified to meet the objectives of the study. Items and variables included in the questionnaire were selected based on the literature review, comments from content experts and the investigator's judgement. In some instances it was necessary to develop questions which would elicit information not previously researched. An acceptable level of face validity for the questionnaire was established by reviewing feedback from: (1) individuals considered knowledgeable in research strategies, scoliosis and adolescent development and (2) pretest respondents considered representative of the study population. Questionnaires were subsequently distributed to 209 adolescent girls with follow-up procedures undertaken to improve the response rate.

A total of 178 useable questionnnaires were returned representing an overall response rate of 85.8 percent. Follow-up procedures were effective in increasing the rate of return by approximately

20 percent. Based on survey responses: (1) respondents' personal perceptions of their general health, current health, health outlook, and health worry/concern were identified; (2) respondents' school attendance, activity limitations, perceptions of happiness and nervousness, and recent experience with illness were identified; (3) the influence of factors considered significant in providing alternative explanations for perceptions of personal health and illness behavior were examined; and (4) differences among the groups were analyzed. Comments, in regards to the questionnaire, were reviewed.

Pertinent findings from the study are presented in the following section.

5.2 Major Findings

Major findings in this section are based on analysis of survey responses.

1. Adolescent girls in the study generally demonstrated positive perceptions in relation to their over-all health with three out of four girls rating it very good or good, one in four rating it excellent and none perceiving it as poor.

2. In comparing results with a study that used the Health Perception

Scales to survey adults, it was interesting to find that the younger age group or adolescents surveyed in this study demonstrated more positive perceptions of their current health and health outlook than an older or adult group. Both age groups demonstrated a similar amount of concern and worry in relation to personal health.

3. Significant differences did not occur among the referral, recheck, negative, and control groups in relation to personal perceptions of general health, current health and health outlook. In relation to the worry/concern measure, the control group demonstrated less worry and concern regarding personal health than was indicated by the other groups.

4. Information regarding respondents' illness behavior identified that approximately three in five of all respondents had experienced some illness in the three months prior to receiving the questionnaire. Approximately one in two of these respondents indicated they had spent some amount of time in bed during this time period or been absent from school as a result of illness. Analyses indicated that differences were not significant among the groups for these specific measures of illness behavior.

5. Results for the psychological distress measure indicated that approximately four in five respondents perceived themselves as

very happy or happy with approximately seven in ten respondents indicating they were never bothered by nervousness. While results were fairly consistent with no significant differences among groups for the happiness measure, a greater degree of nervousness was demonstrated by the negative group. Significant differences occurred on this measure between the: (1) negative and control groups and (2) the negative and recheck groups.

6. Approximately seven in fifty respondents identified that some of their activities had been reduced or restricted as a result of a health problem. Analysis indicated that differences were not significant among the groups. It was interesting to find that the condition of scoliosis was mentioned only once in relation to limiting a respondent's ability to do sit-ups.

7. Only four in twenty-five respondents indicated they had any long term health problems that required them to see a doctor once in awhile. Bone and joint problems and asthma were the most common long term health problems reported by this age group. Scoliosis was specifically named by only two respondents from the referral category.

8. As hypothesized, favourable health perceptions tended to be negatively associated with increases in absenteeism from

school, recent illness, bed days as a result of illness, nervousness, unhappiness, and activity limitations.

9. Hypotheses proposing differences in perceptions of personal health and illness behavior between the: (1) referral and recheck groups and (2) the referral-recheck groups and negative-control groups were rejected at the five percent level.

10. The null hypothesis of no difference in perceptions of personal health and illness behavior between the control and negative groups was rejected at the five percent level. Significant differences occurred between both groups on the measures of: (1) nervousness and (2) worry/concern in relation to personal health. The negative group demonstrated a greater degree of nervousness and worry/concern regarding personal health than the control group.

11. The hypothesis proposing differences in perceptions of personal health and illness behavior between girls screened for scoliosis and the control group was not rejected at the five percent level. Significant differences occurred between the two groups on the measures of: (1) nervous rating and (2) worry/concern in relation to personal health. Girls who were involved in the screening process demonstrated a greater degree of nervousness and worry/concern regarding personal health than the control group.

12. It appears that, as hypothesized, a relationship may exist between being labeled with scoliosis and demonstrating less positive perceptions of personal health and illness behavior. Girls who "perceived" they had been told there was something wrong with their back demonstrated significantly less postive perceptions of their current health and health outlook than girls who indicated they had been told nothing was wrong with their back.

5.3 Conclusions

The conclusions of this study are as follows:

1. Favourable health perceptions are negatively associated with increases in recent illness, activity limitations, nervousness, unhappiness, absence from school, and sick days in~~ bed.~~

2. Girls who are followed over a period of time for a "suspected" curve (recheck group) do not differ significantly in perceptions of personal health and illness behavior from girls who are referred to physicians for confirmation of a diagnosis (referral group).

3. The assumption that the negative and control groups would demonstrate similar perceptions of personal health and illness behavior is not supported by findings obtained in this study.

The negative group demonstrated a greater degree of nervousness and worry/concern regarding personal health than the control group. This might be due to chance, or the influence of factors not investigated in this study. Further research to facilitate interpretation of these findings is indicated.

4. Girls who were involved in the screening process demonstrated a greater degree of nervousness and worry/concern regarding personal health than the control group. This finding suggests that the screening process may have some systematic effect on altering perceptions of health and illness behavior. Replication in another study population is indicated to ensure that the difference between the two groups was not due to socioeconomic factors.

5. The results of this study also suggest that a "negative labeling effect" may occur. Girls who "perceived" they had been told there was something wrong with their back demonstrated significantly less positive perceptions of their current health and heatlh outlook than girls who indicated they had been told nothing was wrong with their back. These results are of particular interest in view of the small percentage of girls within this study who actually have a spinal curve of any significant degree. Further research is indicated to investigate the infuence of variables associated with affecting perceptions of health and illness behavior which were not investigated in this study, e.g. parental income, education and ethnic group.

5.4 Recommendations

Based on the findings of this study the following recommendations are made:

1. Further research is indicated to substantiate and explore findings obtained in this study, particularly, in the area of labeling and its effects on perceptions of health and illness behavior. Additional work should focus on: (1) investigating the influence of variables associated with affecting perceptions of health and behavior which were not included in this study and (2) replicating the study outside of the population surveyed.

2. If the findings are replicated, efforts should be made by programs providing scoliosis screening to ensure that girls who are told they have a curvature of the spine receive appropriate information, understand the implications associated with their diagnosis, and are given an opportunity to clarify any misconceptions they may have in relation to scoliosis.

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APPENDIX A: LETTER OF EXPLANATION TO PARENT OR GUARDIAN (EDMONTON BOARD OF HEALTH)

APPENDIX A

1986 04 18

Dear Parent or Guardian:

As you are aware, the Edmonton Board of Health carries out screening for scoliosis (curvature of the spine) as part of the school health program for girls in grade six. Over the years Edmonton has been involved in a number of studies to learn more about scoliosis. We need to ask your co-operation for just a few minutes to help us increase this knowledge.

We are particularly interested at this time in looking at some of the feelings and opinions girls this age have about their health and comparing results among girls who have been screened for scoliosis and those who have not. This information will help us learn more about how this age group view their health and will enable us to gain more information on the effects of scoliosis screening.

Your daughter was randomly selected to participate from among the group of students screened by public health nurses in April, 1985. It would be very much appreciated if she could complete the enclosed questionnaire and return it in the self-enclosed envelope, by May 2nd, 1986. Since we want to know the student's feelings and opinions, please encourage your daughter to complete the questionnaire by herself. All answers will of course be treated to a confidential manner and used only for this research.

By ensuring the questionnaire is promptly returned, you can help us complete the project efficiently. If you do not wish your daughter to participate, please understand that this will in no way effect the quality or provision of services offered by the Edmonton Board of Health.

Thank you very much.

Karen Mills, R.N., M.H.S.A.
Director of Nursing

KM/al
Encl.

APPENDIX B: LETTER OF EXPLANATION TO PARENT OR GUARDIAN (STURGEON HEALTH UNIT)

APPENDIX B

sturgeon health unit

BOX 174, 23 SIR WINSTON CHURCHILL AVENUE, ST. ALBERT, ALBERTA T8N 1N3
TELEPHONE: 459-6671

1986 04 02

Dear Parent or Guardian:

We need to ask your co-operation for just a few minutes to help us with a project we are participating in with the Edmonton Board of Health.

Since 1979 the Edmonton Board of Health has been involved in a pilot project to learn more about screening girls for a condition known as scoliosis or curvature of the spine. During this time Edmonton has undertaken a number of studies to increase existing knowledge on scoliosis. At the present time they are particularly interested in looking at some of the feelings and opinions girls in the seventh grade have about their health and comparing results among girls who have been screened for scoliosis and those who have not. This information will help us learn more about how this age group view their health and will enable us to gain more information on the effects of scoliosis screening.

Your daughter was randomly selected to participate from among grade seven girls attending St. Albert School District #6. It would be very much appreciated if she could complete the enclosed questionnaire and return it in the self-addressed envelope by May 2nd, 1986. Since we want to know the student's feelings and opinions, please encourage your daughter to complete the questions by herself. All answers will of course be treated in a confidential manner and used only for this research.

By ensuring the questionnaire is promptly returned, you can help us complete the project efficiently. If you do not wish your daughter to participate, please understand that this will no way affect the quality or provision of services offered by the Sturgeon Health Unit.

Thank you very much.

Sincerely,

Janet L. Thorpe, R.N., B.Sc.N.
Director of Nursing

JLT:sm

Encl.

APPENDIX C: QUESTIONNAIRE

APPENDIX C

Dear Student:

To help us learn more about how girls your age feel about their health, it would be very much appreciated if you could complete this questionnaire. We are especially interested in gaining more information about a screening program that checks the backs of girls for a curvature of the spine (scoliosis). Answers will be compared among girls who have been checked for a curvature of the spine and those who have not. Since we want to know your feelings and opinions, it is important that you answer the questions by yourself. Your answers will not be shown to anyone else.

PLEASE PUT YOUR COMPLETED QUESTIONNAIRE IN THE ENVELOPE PROVIDED AND MAIL BACK TO THE STURGEON HEALTH UNIT BY MAY 2, 1986.

Thank you for your time and help with this project.

Questionnaire

First I would like to ask you some questons about your health. Please place a check-mark (✓) beside the answer you choose for each question.

1. Compared to other girls your age would you say your health is --

1 ( ) Excellent
2 ( ) Very good
3 ( ) Good
4 ( ) Fair
5 ( ) Poor

2. Has a doctor or nurse ever checked your back for a curvature of the spine (scoliosis)?

1 ( ) Yes
2 ( ) No
3 ( ) Don't Know

3. Have you been told you have a curvature of the spine (scoliosis)?

1 ( ) Yes
2 ( ) No
3 ( ) Don't Know

4. Do you have any long term health problems that require you to see a doctor once in a while? By long term I mean a health problem that has lasted or will probably last 6 months or longer.

1 ( ) Yes
2 ( ) No --> Go to 6

5. Please name the health problem(s) ____________________
(Name as many as you want to) ____________________
____

6. Were you injured at any time during the last 3 months?

1 ( ) Yes
2 ( ) No --> Go to 8

7. Was this injury very serious?

1 ( ) Yes
2 ( ) No

8. Were you sick at any time during the last 3 months?

1 ( ) Yes
2 ( ) No --> Go to 10

9. Was this illness very serious?

1 ( ) Yes
2 ( ) No

---

10. During the last 3 months did you spend all or part of any days in bed because you were sick?

1 ( ) Yes
2 ( ) No --> Go to 12

11. Please check (✓) the number of days you spent in bed during the last 3 months because you were sick ---

1 ( ) 2 days or less
2 ( ) 3 to 7 days
3 ( ) 8 to 14 days
4 ( ) 15 to 21 days
5 ( ) 22 to 28 days
6 ( ) More than 4 weeks

---

12. Have you been absent from school during the last 3 months because you were sick?

1 ( ) Yes
2 ( ) No --> Go to 14

13. Please check (✓) the number of days you were absent from school during the last 3 months because you were sick --

1 ( ) 2 days or less
2 ( ) 3 to 5 days
3 ( ) 6 to 10 days
4 ( ) 11 to 15 days
5 ( ) 16 to 20 days
6 ( ) More than 4 weeks

---

14. Most of the time would you say you're --

1 ( ) Very happy
2 ( ) Happy
3 ( ) Somewhat happy
4 ( ) Very unhappy

15. Have you been bothered by nervousness, for example, by being irritable, fidgety and tense?

1 ( ) Never
2 ( ) Sometimes
3 ( ) Often

The next few questions are about your health and the activities you do.

16. Are any of your activities reduced or restricted because of a health problem?

1 ( ) Yes
2 ( ) No --> Go to 18

17. Place a check mark (✓) beside any of the following activities that are reduced or restricted for you because of a health problem. Choose as many activites as you need to. For each activity you choose, name the health problem that has affected the activity and the length of time the activity has been reduced or restricted. Write your answers beside the activity in the space provided.

Activities	Health Problem	Length of Time Activity has been Reduced & Restricted
1( ) Housework		
2( ) Recreational Activities (such as skiing, skating, swimming, golfing, bicycling, etc.)		
3( ) Team sports (such as basketball, volleyball, baseball, etc.)		
4( ) Dancing		
5( ) Jogging or Running		
6( ) Other, please name		

Now I'd like to know some of the feelings you have and opinions you've been given about your health. Please check (✓) the answer you feel is most correct for each statement.

18.		Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a)	According to the doctors I've seen, my health is now excellent	( )	( )	( )	( )	( )
b)	I feel better now than I ever have before	( )	( )	( )	( )	( )
c)	I am somewhat ill	( )	( )	( )	( )	( )
d)	I'm not as healthy now as I used to be	( )	( )	( )	( )	( )
e)	I'm as healthy as anybody I know	( )	( )	( )	( )	( )
f)	My health is excellent	( )	( )	( )	( )	( )
g)	I have been feeling bad lately	( )	( )	( )	( )	( )
h)	Doctors say that I am now in poor health	( )	( )	( )	( )	( )
i)	I feel about as good now as I ever have	( )	( )	( )	( )	( )

19.		Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a)	I will probably be sick a lot in the future	( )	( )	( )	( )	( )
b)	In the near future, I expect to have better health than other people I know	( )	( )	( )	( )	( )

19. (Cont'd)		Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
c)	I expect to have a very healthy life	( )	( )	( )	( )	( )
d)	I think my health will be worse in the future than it is now	( )	( )	( )	( )	( )
20.						
a)	I never worry about my health	( )	( )	( )	( )	( )
b)	I worry about my health more than other people worry about their health	( )	( )	( )	( )	( )
c)	My health is a concern in my life	( )	( )	( )	( )	( )
d)	Others seem more concerned about their health than I am about mine	( )	( )	( )	( )	( )

Finally a question about yourself. Some curves of the spine change around the time girls have their first menstrual period. Because we would like to learn as much as we can about scoliosis or curvature of the spine, it is important to know if girls taking part in this study have had their first menstrual period. Please place a checkmark (✓) beside the answer you choose.

21. Have you had your first menstrual period?
1 ( ) Yes
2 ( ) No
3 ( ) Don't Know

Any comments you would like to make about this questionnaire would be most helpful.

Comments: ______________________________

____

____

THANK-YOU!

APPENDIX D: INTERNAL-CONSISTENCY RELIABILITY COEFFICIENTS FOR EIGHT HPQ SCALES

APPENDIX D

Internal-Consistency Reliability Coefficients for Eight HPQ Scales (Four Field Tests)

Scale	No. of Items in Scale	Internal-Consistency Coefficient		
		Low	High	Median
Current Health	9	0.89	0.92	0.91
Prior Health	3	0.70	0.79	0.73
Resistance/ Susceptibility	4	0.58	0.80	0.71
Health Outlook	4	0.64	0.79	0.75
Health Worry/ Concern	4	0.45	0.62	0.60
Sickness Orientation	2	0.46	0.61	0.59
Rejection of Sick Role	4	0.54	0.60	0.59
Attitude Toward Going to Doctor	2	0.62	0.79	0.67

APPENDIX E: LETTER OF EXPLANATION TO EDMONTON PUBLIC SCHOOL BOARD

APPENDIX E

Edmonton Local Board of Health
Community Health Services for the Edmonton Health District

Suite 500, 10216 - 124 Street, Edmonton, Alberta T5N 4A3
Telephone (403) 482-1965

1986 04 04

Dr. Tom Blowers
Director of Monitoring Education and Program Review
Edmonton Public School Board
1 Kingsway
EDMONTON, Alberta
T5H 0Z8

Dear Dr. Blowers:

I would like to inform you of a research project entitled: "A Survey of the Health Perceptions and Illness Behaviour of Adolescent Girls Screened for Scoliosis", which the Edmonton Board of Health has agreed to support.

As you are aware, the Edmonton Board of Health carries out scoliosis screening for girls in grade VI. Since 1979, when the screening was included as part of the school health program, Edmonton has been involved in investigating a number of areas pertinent to increasing knowledge on scoliosis and scoliosis screening. This particular study, which is a thesis project, focuses on identifying perceptions of personal health and illness behaviour of girls in grade VII. Results will be compared among grade VII girls in Edmonton who have been screened for scoliosis and grade VII girls in the St. Albert area, who for the most part, have not been exposed to a scoliosis screeing program. This information will help us learn more about how this age group view their health and will enable us to gain more information on effects associated with the scoliosis screening process.

Girls will be randomly selected to participate from among the group of students screened by public health nurses in April, 1985. This will involve approximately 150 girls. To facilitate locating these girls, questionnaires with an accompanying letter to the parent or guardian will be delivered to the appropriate school by public health nurses during the week of 1986 04 21. Envelopes containing this information will be sealed and addressed to the parents or guardians of students selected to participate in the study. The only involvement that may be requested of the school, would be the distribution of these envelopes to the designated students. The questionnaires are to be completed at home and mailed back to the Edmonton Board of Health in envelopes provided for this purpose, by 1986 05 02.

The research proposal has been enclosed for your information. If you have any questions regarding this project, please contact me.

Yours sincerely,

J. M. Howell, MB, MFCM, FRCPC
Medical Officer of Health

BJ/lmp
Enc.

APPENDIX F: LETTER OF EXPLANATION TO EDMONTON CATHOLIC SCHOOL DISTRICT

APPENDIX F

Edmonton Local Board of Health
Community Health Services for the Edmonton Health District

Suite 500, 10216 - 124 Street, Edmonton, Alberta T5N 4A3
Telephone (403) 482-1965

1986 04 04

Mr. William G. Hart, Superintendent of Student Services
Edmonton Catholic School District
St. Kevin's School
10005 - 84 Street
EDMONTON, Alberta
T6A 3P8

Dear Mr. Hart:

I would like to inform you of a research project entitled: "A Survey of the Health Perceptions and Illness Behaviour of Adolescent Girls Screened for Scoliosis", which the Edmonton Board of Health has agreed to support.

As you are aware, the Edmonton Board of Health carries out scoliosis screening for girls in grade VI. Since 1979, when the screening was included as part of the school health program, Edmonton has been involved in investigating a number of areas pertinent to increasing knowledge on scoliosis and scoliosis screening. This particular study, which is a thesis project, focuses on identifying perceptions of personal health and illness behaviour of girls in grade VII. Results will be compared among grade VII girls in Edmonton who have been screened for scoliosis and grade VII girls in the St. Albert area, who for the most part, have not been exposed to a scoliosis screeing program. This information will help us learn more about how this age group view their health and will enable us to gain more information on effects associated with the scoliosis screening process.

Girls will be randomly selected to participate from among the group of students screened by public health nurses in April, 1985. This will involve approximately 150 girls. To facilitate locating these girls, questionnaires with an accompanying letter to the parent or guardian will be delivered to the appropriate school by public health nurses during the week of 1986 04 21. Envelopes containing this information will be sealed and addressed to the parents or guardians of students selected to participate in the study. The only involvement that may be requested of the school, would be the distribution of these envelopes to the designated students. The questionnaires are to be completed at home and mailed back to the Edmonton Board of Health in envelopes provided for this purpose, by 1986 05 02.

The research proposal has been enclosed for your information. If you have any questions regarding this project, please contact me.

Yours sincerely,

J. M. Howell, MB, MFCM, FRCPC
Medical Officer of Health

BJ/lmp
Enc.

APPENDIX G: LETTER OF EXPLANATION TO ST. ALBERT PROTESTANT SEPARATE SCHOOL DISTRICT # 6

sturgeon health unit

BOX 174, 23 SIR WINSTON CHURCHILL AVENUE, ST. ALBERT, ALBERTA T8N 1N3
TELEPHONE: 459-6671

1986 04 02

Mr. Lawrence Beaudry
Superintendent
St. Albert Protestant Separate School District #6
60 Sir Winston Churchill Avenue
St. Albert, Alberta
T8N 0G4

Dear Mr. Beaudry:

I would like to inform you of a research project entitled: "A Survey of the Health Perceptions and Illness Behavior of Adolescent Girls Screened for Scoliosis", which the Sturgeon Health Unit will be participating in with the Edmonton Board of Health.

Since 1979 the Edmonton Board of Health has been involved in a pilot project to learn more about screening girls for the condition known as scoliosis or curvature of the spine. During this time they have investigated a number of areas pertinent to increasing knowledge on scoliosis and scoliosis screening. This particular study, which is a thesis project, focuses on identifying perceptions of personal health and illness behavior of girls in grade seven. Results will be compared among grade seven girls in Edmonton who have been screened for scoliosis and grade seven girls in the St. Albert area, who for the most part, have not been exposed to a scoliosis screening program. This information will help us learn more about how this age group view their health and will enable us to gain more information on effects associated with the scoliosis screening process.

Sixty girls, representing the control group, will be randomly selected from among grade seven girls attending public schools in the St. Albert area. To facilitate locating these girls, questionnaires with an accompanying letter to the parent or guardian will be delivered to the appropriate school by community health nurses the week of April 21, 1986. Envelopes containing this information will be sealed and addressed to the parents or guardians of students selected to participate in the study. The only involvement that may be requested of the school, would be the distribution of these envelopes to the designated students. The questionnaires are to be completed at home and mailed back to the Sturgeon Health Unit in envelopes provided for this purpose by May 2nd, 1986.

..../2

The research proposal has been enclosed for your information. If you have any questions regarding this project, please do not hesitate to contact me.

Yours sincerely,

Dr. K. W. Hodgins
Medical Officer of Health

KWH:sm

Encl.

APPENDIX H: SUMMARY OF ADOLESCENT GIRLS COMMENTS IN RELATION TO THE QUESTIONNAIRE

APPENDIX H

Summary of Adolescent Girls' Comments in Relation to the Questionnaire

Any comments you would like to make about this questionnaire would be most helpful.

1. Referral Category (26 Respondents):

(61%) 16 - No comments

(11%) 3 - Commented they liked the questionnaire

(8%) 2 - Commented they had slight curvatures of the spine that did not cause them concern or restrict activities.

(4%) 1 - Commented more people from school should receive the questionnaire and a nurse should explain scoliosis as it was regarded as a big concern.

(4%) 1 - Commented she had answered the questionnaire with her dad.

(4%) 1 - Commented the questionnaire should have included feelings in regard to having or not having scoliosis.

(4%) 1 - Commented she had been having cramps lately which was probably related to the start of menstruation.

(4%) 1 - Inquired as to what would be done with the information on the questionnaire.

2. Recheck Category (54 Respondents):

(65%) 35 - No comments

(9%) 5 - Commented they liked the questionnaire.

(9%) 5 - Commented on the importance of learning more about scoliosis.

(2%) 1 - Commented on the similarity of the questions.

(2%) 1 - Commented on how much she appreciated her school nurse who had taught her "a lot" about scoliosis.

(2%) 1 - Inquired if answering the questionnaire indicated she had scoliosis. "My family doctor said I didn't and the nurse at school said she doesn't know".

(2%) 1 - Inquired how health affected scoliosis.

(2%) 1 - Indicated her curvature of the spine had not restricted any activities or affected her health.

(2%) 1 - Commented that her father is a chiropractor and they are aware of these types of problems.

(2%) 1 - Clarified response to Question 1. Indicated experienced dizziness and pains in side.

(2%) 1 - Commented that her curvature of the spine may be a result of daily skating.

(2%) 1 - Commented that when you have scoliosis like she does there is a tendency to be tired frequently and have many colds.

3. Negative Category (49 Respondents):

(61%) 30 - No Comments

(6%) 3 - Commented they liked the questionnaire.

(4%) 2 - Inquired as to why they had been chosen to participate in the study.

(4%) 2 - Inquired about specific menstrual problems.

(2%) 1 - Commented she thought the questionnaire was a good idea.

(2%) 1 - Commented she thought it was good to check girls to help prevent scoliosis.

(2%) 1 - Requested more information being made available to her on scoliosis.

(2%) 1 - Commented that the questionnaire had helped her to take a good look at herself and made her more aware of herself and her friends.

(2%) 1 - Indicated she had made a few mistakes on the questionnaire.

(2%) 1 - Indicated she did not feel healthy because she was overweight.

(2%) 1 - Indicated the only health problem she had was severe cramps with her periods.

(2%) 1 - Clarified which grade she was presently in.

(2%) 1 - Indicated that the question regarding menstruation was "none of your business".

(2%) 1 - Inquired as to why the questionnaire was sent out.

(2%) 1 - Commented she was happy that nurses checked girls for scoliosis as one of her friends was found to have scoliosis.

(2%) 1 - Commented she thought it was good that people are concerned with childrens' health and "are trying to stop diseases like scoliosis".

4. Control Category (49 Respondents):

(67%) 33 - No Comments

(6%) 3 - Commented on the importance of learning more about scoliosis.

(4%) 2 - Clarified answers to specific questions.

(4%) 2 - Inquired as to how they were chosen to participate in the study.

(2%) 1 - Commented she liked the questionniare.

(2%) 1 - Indicated she had been checked for scoliosis by her physician a few weeks previous to receiving the questionnaire.

(2%) 1 - Commented that she never really thinks about her health.

(2%) 1 - Indicated that Question #14 should have included "unhappy" and "okay" in the choices.

(2%) 1 - Clarified her age.

(2%) 1 - Commented that the questionnaire was a good idea but couldn't see the significance of being asked about the start of menstruation.

(2%) 1 - Inquired about scoliosis.

(2%) 1 - Indicated she had been checked and informed about scoliosis.

(2%) 1 - Commented that some of the questions were difficult to answer.